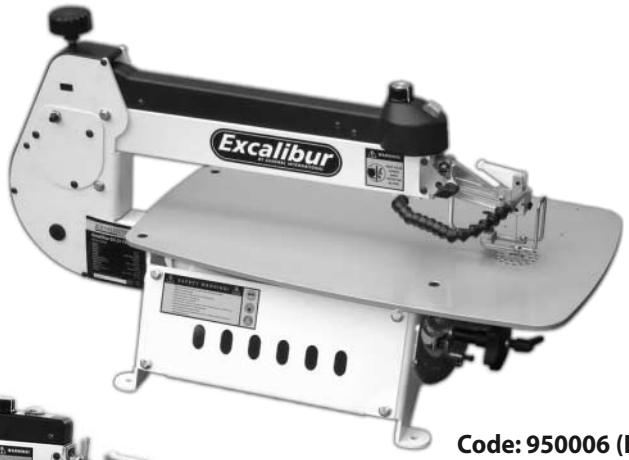
AXMINSTER®
TOOL CENTRE

# Excalibur EX-16, EX-21 & EX-30 Scroll Saws

This is a range of three scroll saws with some really different features not found on any other machines available in the UK. Constructed mainly from plate steel including a 7mm heavy gauge steel table with an epoxy painted surface. Two unique features make these machines stand out from any other. Firstly, the blade actuating arms are very short, driven by a lever and rod mechanism. This gives very high control of the blade plus exceptionally low vibration. Secondly, the whole arm assembly tilts 45° from the vertical left to right, leaving the table horizontal. This allows much better control of the work, due to greater visibility and being able to work at a natural position. You are not fighting gravity or bending your wrists into awkward positions. These machines are not short of other features, having a variable speed control system giving from 400-1,400 strokes per minute. Blade changing is easy and tool free, with two hand clamps and a quick release lever. An air blower and work hold down are provided. Plus there is efficient dust collection when connected to a suitable fine dust extractor. Rubber feet are supplied, or you can permanently mount the machine onto your workbench. Using unpinned blades means there is a large selection of blades available, or you can use 150mm lengths of 1/4" bandsaw blade, ideal for cutting thicker materials. Available in three sizes, 16", 21" and 30", just choose the one that suits your work. These are serious machines for craft or artistic work, not the same as any others.

**Code: 953432 (EX-16)**




**Code: 950006 (EX-21)**

**Code: 950007 (EX-30)**

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# Introduction/Warranty

***THANK YOU*** for purchasing the Excalibur model EX-16, EX-21 & EX-30 scroll saw. The scroll saws has been carefully tested and inspected before shipment and if properly used and maintained, will provide you with years of reliable service. To ensure optimum performance and trouble-free operation, and to get the most from your investment, please take the time to read this manual before assembling, installing and operating the unit.

The manual's purpose is to familiarize you with the safe operation, basic function, and features of this scroll saw as well as the set-up, maintenance and identification of its parts and components. This manual is not intended as a substitute for formal woodworking instruction, nor to offer the user instruction in the craft of woodworking. If you are not sure about the safety of performing a certain operation or procedure, do not proceed until you can confirm, from knowledgeable and qualified sources, that it is safe to do so.

Once you've read through these instructions, keep this manual handy for future reference.

**WARRANTY**

All component parts of Excalibur by Axminster Tool Centre are carefully tested and inspected during all stages of production, and each unit is thoroughly inspected upon completion of assembly. Because of our commitment to quality and customer satisfaction, Axminster Tool Centre agrees to repair or replace, within a period of 2 years from date of purchase, any genuine part or parts which, upon examination, prove to be defective in workmanship or material. In order to obtain this warranty, all defective parts must be returned freight pre-paid to Axminster Tool Centre. Repairs attempted without our written authorization will void this warranty. Disclamer: The information and specifications in this manual pertain to the unit as it was supplied from the factory at the time of printing. Because we are committed to making constant Improvements, Axminster Tool Centre reserves the right to make changes to components, parts or features of this unit as deemed necessary, without prior notice and without obligation to install any such changes on previously delivered units. Reasonable care is taken at the factory to ensure that the specifications and information in this manual corresponds with that of the unit with which it was supplied. However, special orders and "after factory" modifications may render some or all information in this manual inapplicable to your unit. Further, as several generations of this scroll saw and several versions of this manual may be in circulation, if you own an earlier or later version of this unit, this manual may not depict your unit exactly. If you have any doubts or questions contact your retailer or our support line with the model and serial number of your unit for clarification.

## Warning

**The symbols below advise that you follow the correct safety procedures when using this machine.**

**Fully read manual and safety instructions before use**

**Ear protection should be worn**

**Eye protection should be worn**

**Dust mask should be worn**

**Keep hands away from moving parts and cutting area**

**⚠ To help ensure safe operation, please take a moment to learn the machine's applications and limitations, as well as potential hazards. Axminster Tool Centre disclaims any real or implied warranty and holds itself harmless for any injury that may result from the improper use of its equipment.**

**1.** Be sure to read, understand and follow all safety warnings and instructions in the supplied Operator's Manual.

**2.** Do not operate the saw when tired, distracted, or under the effects of drugs, alcohol or any medication that impairs reflexes or alertness. Stay alert! Give your work your undivided attention.

**3.** Keep the work area well lit, clean and free of debris. Cluttered areas and benches invite injuries.

**4.** Keep children and shop visitors at a safe distance while operating the saw; do not permit them to operate the scroll saw.

**5.** Childproof and tamper proof your shop and all machinery with locks, master electrical switches and switch keys, to prevent unauthorized or unsupervised use. Fine particulate dust is a carcinogen that can be hazardous to health. Work in a well ventilated area and use a dust collector whenever possible.

**7.** Wear approved safety glasses, dust mask and non-skid footwear. Do not wear loose clothing, gloves, bracelets, necklaces or jewellery while operating the saw. Keep long hair contained by wearing protective hair covering.

**8.** Be sure all adjustment tools, wrenches or other clutter are removed from the machine and/or the table surface before operation. When not in use, tools should be locked-up in a dry place, out of children's reach and away from flammable substances.

**9.** Keep hands well away from saw blade and all moving parts. Use a brush, not hands, to clear away chips and sawdust.

ed full operating speed before beginning to cut.

**11.** Do not push or force stock into the blade. The saw will perform better and more safely when working at the rate for which it was designed. Do not use for purposes not intended.

**12.** Avoid working from awkward or off balance positions. Do not overreach while cutting; keep both feet on floor. Never lean over or reach behind the blade and never pull the workpiece through the cut from behind.

**13.** Never stand or lean on the saw. Serious injury could occur if the unit is tipped over or if the blade is unintentionally contacted.

**14.** Use of parts and accessories NOT recommended by Axminster Tool Centre may result in equipment malfunction or risk of injury.

**15.** Never leave the machine unattended while running or with the power "ON".

**16.** Always turn off and disconnect from power source before servicing or changing accessories, blades, bits, and cutters, or before performing any maintenance or adjustments.

**17.** Make sure that switch is in the "OFF" position before plugging in the power cord. Do not use the saw if the power switch is defected, have defective switches replaced by an authorized service centre.

**18.** Make sure saw is properly grounded. If equipped with a 3-prong plug it should be used with a three-pole receptacle. Never remove the third prong. Avoid body contact with grounded surfaces (e.g. pipes, radiators, stoves, refrigerators).

**19.** Repairs to the saw should only be carried out by qualified people using original spare parts. A guard or other damaged part should be properly repaired or replaced by an authorized service centre.

**20.** Inspect power cords and extension wires periodically. If damaged, have them repaired by an authorized service facility. Never yank cords and wires and keep away from heat, oil, and sharp edges.

**21.** This tool is for indoor use only. Do not expose to rain or use in wet or damp locations.

# Additional Safety Instructions Specific to this Scroll Saw

**Because each shop situation is unique, no list of safety guidelines can ever be complete. The most important safety feature in any shop is the knowledge and good judgement of the user. Use common sense and always keep safety considerations, as they apply to your individual shop situation first and foremost in mind. If you have any doubts about the safety of an operation you are about to perform: STOP! Do not perform the operation until you have validated from qualified individuals if the operation is safe to perform and what is the safest method to perform it.**

1. Material hold-down must be properly set and remain in position during use.
2. Never reach under the table when operating or make any adjustments while the scroll saw is running.
3. Secure the saw to the work bench with clamps or mounting hardware.
4. Where possible, use clamps or a vice to secure your workpiece. It is safer than using your hand.
5. Do not lift or carry the saw by the upper arm.
6. Make sure blade tension is properly adjusted.
7. Avoid awkward hand positions where a sudden slip could cause a hand to move into the saw blade. Do not place fingers or hands in the path of the saw blade.
8. When removing short workpieces, or cleaning up around the table, be sure that the switch is in the OFF position and that the blade has come to a complete stop.
9. Never turn the saw ON before making sure that the table is clear except for the workpiece and related feed or support devices for the operation planned.
10. Check for proper blade size and type.
11. Do not attempt to saw stock that does not have a flat surface unless a suitable support is used.
12. Turn off motor if the material resists being backed out of an incomplete cut. Use appropriate speed for applications.
13. CAUTION: Some wood contains preservatives such as copper chromium arsenate (CCA) which can be toxic. When cutting these materials, extra care should be taken to avoid inhalation and to minimize skin contact.
14. Always use a dust mask and safety glasses when sawing.
15. Keep guards in place and in working order.
16. Make sure your fingers do not contact the terminals of the power cord plug when plugging in or unplugging the saw.
17. Never overfeed or force work into the blade.
18. Check for alignment and binding of all moving parts, broken parts, mounting and any other conditions that may affect the saw's operation.
19. Keep handles dry and free from oil and grease.

**To avoid electrical shock, ensure machine is properly grounded. Do not operate in damp conditions. Disconnect from power supply before servicing. Replace fuse with the same type and rating only - 3 Amp.**

**Be sure to read and understand owner's manual before operating.**

**Before connecting the machine to the power source, verify that the voltage of your power supply corresponds with the voltage specified on the motor I.D. nameplate. A power source with greater voltage than needed can result in serious injury to the user as well as damage to the machine. If in doubt, contact a qualified electrician before connecting to the power source.**

**This tool is for indoor use only. Do not expose to rain or use in wet or damp locations.**

a

## GROUNDING INSTRUCTIONS

In the event of an electrical malfunction or short circuit, grounding reduces the risk of electric shock. The motor of this machine is wired for **240V** single phase operation and is equipped with a 3-conductor cord and a 3-prong grounded plug to fit a grounded type receptacle, a

***Note: The use of an adaptor plug is illegal in some areas. Check your local codes.***

DO NOT MODIFY THE PLUG PROVIDED.
If it will not fit your receptacle, have the proper receptacle installed by a qualified electrician.

CHECK with a qualified electrician or service person if you do not completely understand these grounding instructions, or if you are not sure the tool is properly grounded.

## EXTENSION CORDS

USE ONLY 3-WIRE EXTENSION CORDS THAT HAVE 3-PRONG GROUNDING PLUGS AND 3-POLE RECEPTACLES THAT ACCEPT THE TOOLS' PLUG. REPAIR OR REPLACE A DAMAGED OR WORN POWER CORD OR PLUG IMMEDIATELY.

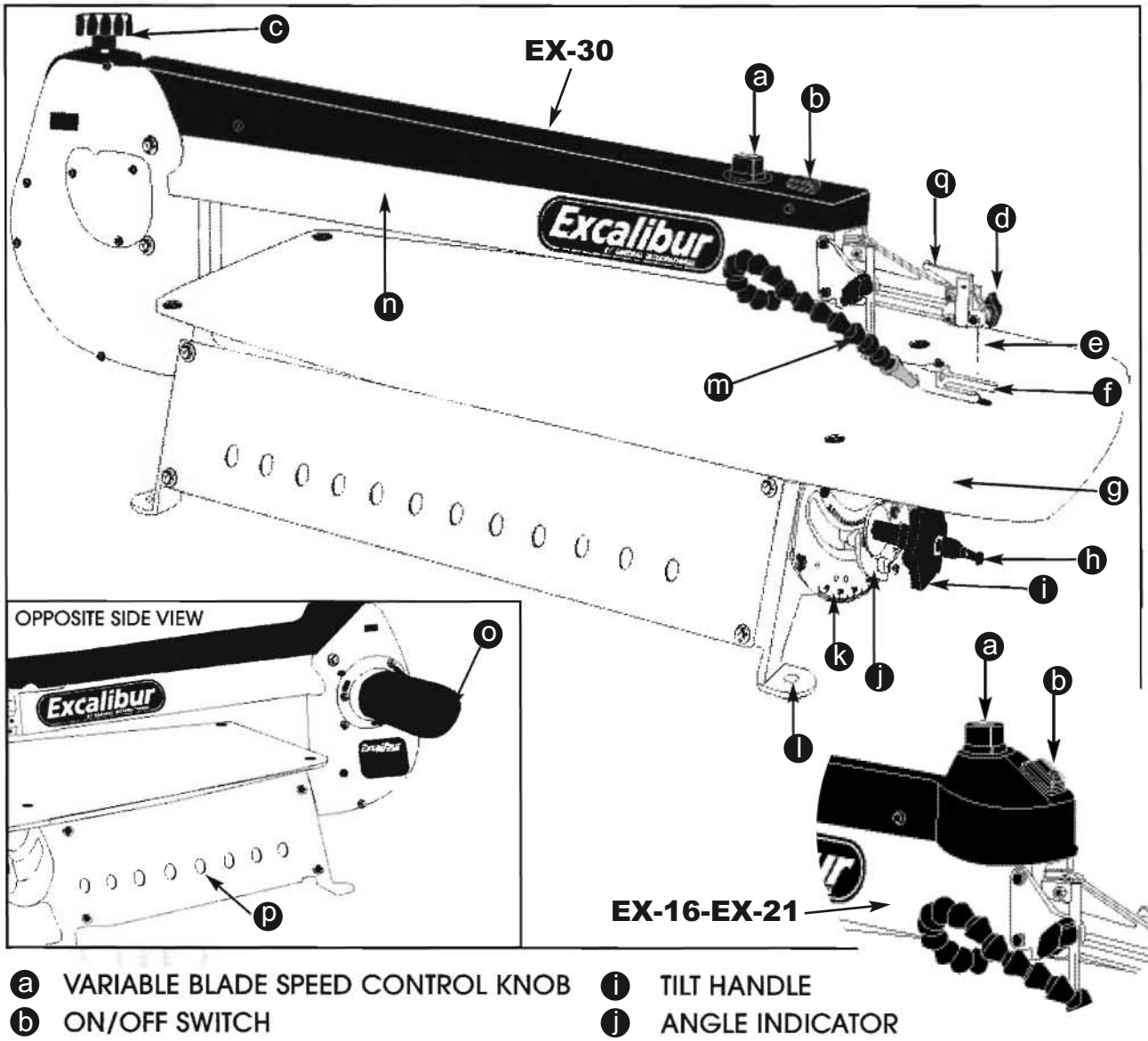
If you find it necessary to use an extension cord with your machine make sure the cord rating is suitable for the amperage listed on the motor I.D. plate. An undersized cord will cause a drop in line voltage resulting in loss of power and overheating. The accompanying chart shows the correct size extension cord to be used based on cord length and motor I.D. plate amp rating. If in doubt, use the next heavier gauge. The smaller the number the heavier the gauge.

| AMPERES (AMPS) | EXTENSION CORD LENGTH | | | | | |
|---|---|---|---|---|---|---|
| | 25 FEET | 50 FEET | 75 FEET | 100 FEET | 150 FEET | 200 FEET |
| <5 | 16 | 16 | 16 | 14 | 12 | 12 |
| 5 TO 8 | 16 | 16 | 14 | 12 | 10 | NR |
| 8 TO 12 | 14 | 14 | 12 | 10 | NR | NR |
| 12 TO 15 | 12 | 12 | 10 | 10 | NR | NR |
| 15 TO 20 | 10 | 10 | 10 | NR | NR | NR |
| 21 TO 30 | 10 | NR | NR | NR | NR | NR |

*Based on limiting the line voltage drop to 5V at 150% of the rated amperes.
**NR = Not Recommended**

# Identification of Main Parts & Components

**16" 21" & 30" SCROLL SAW**
EX-16, EX-21 & EX-30




- a VARIABLE BLADE SPEED CONTROL KNOB
- b ON/OFF SWITCH
- c UPPER ARM TENSIONER
- d BLADE CLAMP
- e BLADE
- f WORKPIECE HOLD DOWN
- g TABLE
- h BLADE TILT LOCKING LEVER
- i TILT HANDLE
- j ANGLE INDICATOR
- k ANGLE ADJUSTMENT SCALE
- l MOUNTING HOLES (4)
- m BLOWER
- n UPPER ARM
- o MOTOR
- p BLADE HOLDER SOCKETS
- q BLADE TENSION LEVER

**UNPACKING**

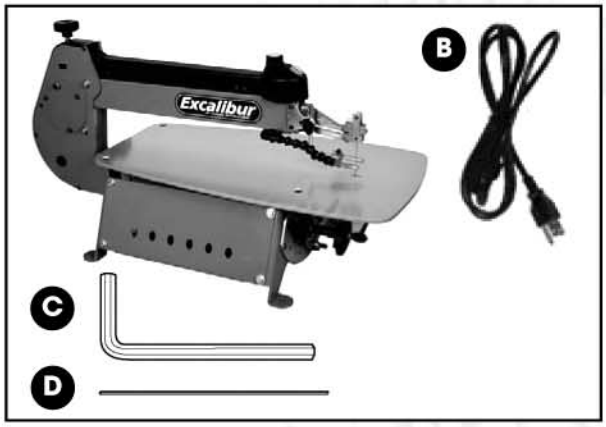
Carefully unpack and remove the scroll saw and its components from the box and check for missing or damaged items as per the list of contents below.

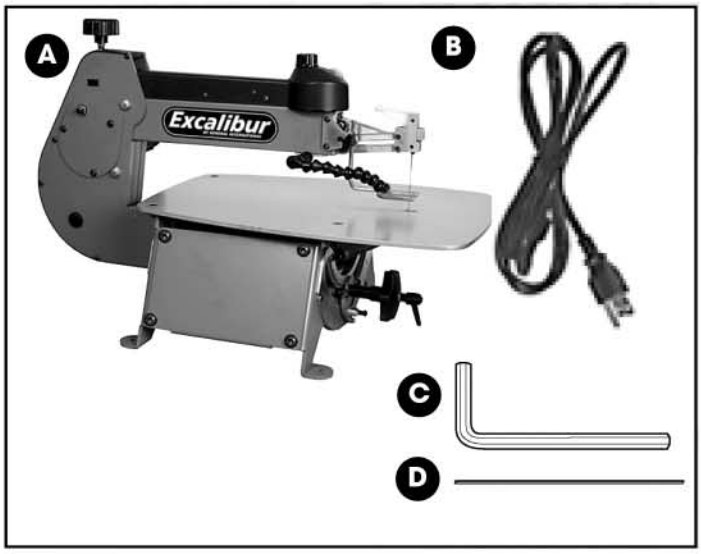
**Note: Please report any damaged or missing items to your General International distributor immediately.**

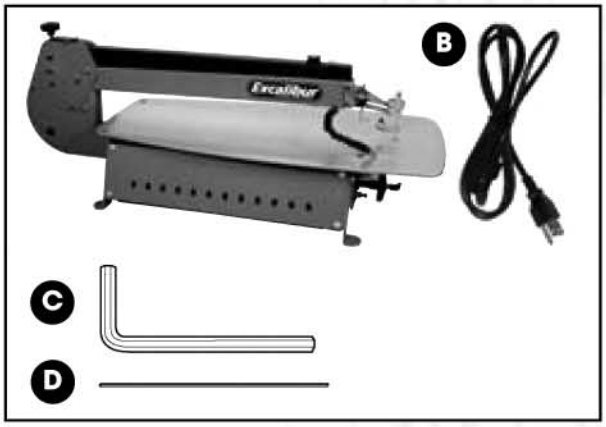
Once the parts have been removed from the packaging, you should have the following items:

**LIST OF CONTENTS** **QTY**

**A** - SCROLL SAW.....1
**B** - POWER CORD.....1
**C** - 3 MM ALLEN KEY.....1
**D** - BLADE.....1



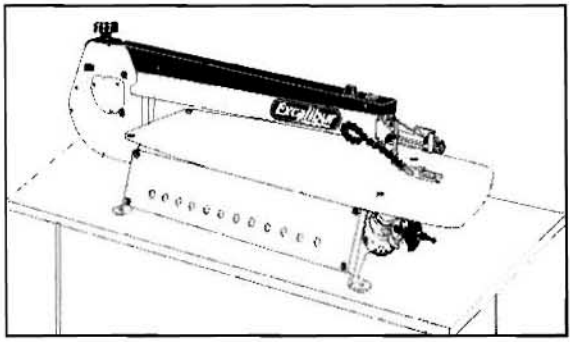



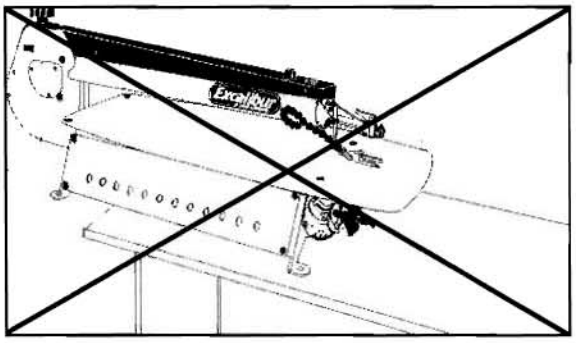



Unscrew the 4 shipping bolts and remove the saw from the protective plywood shipping base. For your convenience this scroll saw is shipped from the factory partially assembled and requires only minimal assembly and set-up before being put into service.

**Before starting the assembly, make sure that the switch is in the "OFF" position and that the power cord is unplugged. Do not plug in or turn on the scroll saw until you have completed the assembly and installation steps described in this section of the manual.**



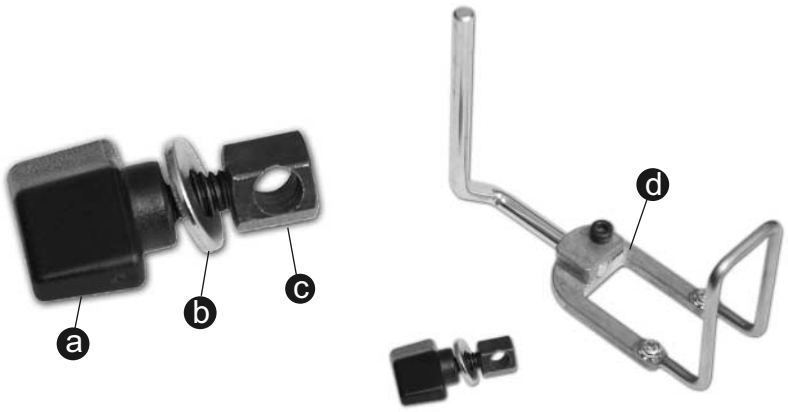

The unit should be installed on a flat, sturdy and stable surface able to support the weight of the machine and the workpiece with ease.

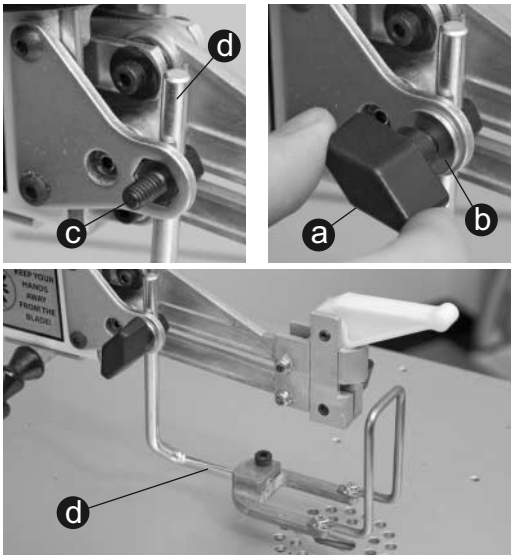



Never install the machine over the edge of a table or workbench.

# Installation & Assembly

## Saw guard assembly



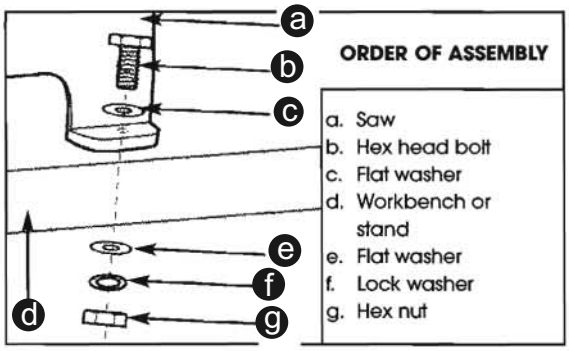



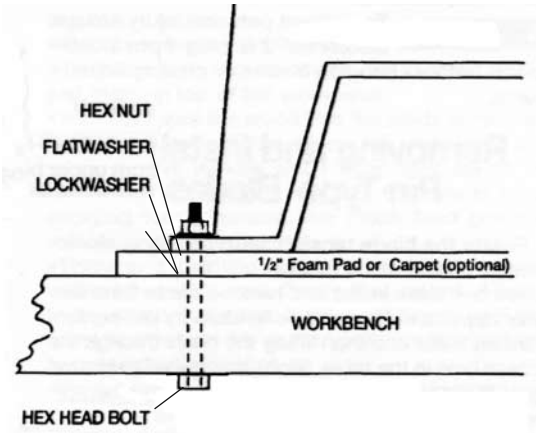

Slot the guard clamping arm **(d)** through the pre-drilled hole in the hexagon clamp **(c)**. Insert the hexagon clamp **(c)** into the brackets hexagon recess, place the washer **(b)** over the hexagon clamp thread and secure using the butterfly clamping knob **(a)**.

**NOTE: DO NOT OVERTIGHTEN otherwise you may strip the thread**

Saw guard assembly **(d)** assembled

## Mounting to a work surface




**It is strongly recommended that you mount the machine to a workbench or to a purpose built stand, a pad between the scroll saw and the workbench/stand is also recommended to reduce vibration.**

Drill four 8mm holes in your workbench/stand and secure using nuts bolts washers (Not Included).

## Attaching the power cord

Plug the female end of the power cord into the socket at the rear of the saw as shown.

# Choosing & Installing a Saw Blade

## Blade Selection

Blade selection is dependent on the type and thickness of the material being cut, but is also a matter of experience and personal preference. There are numerous types of blades available on the market specifically suited for various cutting applications such as metal-cutting and spiral blades which cut in all directions. Try test-cutting with a sample of each to determine which blade works best for you with different materials. Replacement and specialty blades can be purchased from a variety of sources. Ask your local tool or scroll saw dealer for suggestions for **unpinned 5" scroll saw blades** based on what is available in your area.

Some general guidelines to consider when choosing blades:

- Wide, thick blades with coarse teeth are suited to cutting straight lines and sweeping curves, but will not turn tight corners. They will cut aggressively and leave a fairly smooth finish, but may leave burn marks if the work piece is turned too tightly.
- Narrower, thinner blades with finer teeth will cut more slowly, but will turn much tighter corners for cutting very intricate work. They will impart a very smooth, burnished finish that requires no sanding.
- Consider material thickness when selecting blades. Ensure that a minimum of two or three teeth are in contact with the workpiece at all times. For example, when cutting 1/8" thick material, use a blade with a minimum of of 16-20 teeth per inch.

## SKIP TOOTH

Regular evenly spaced tooth pattern. Considered the most common of scroll saw blades, they are available in the widest range of sizes and provide a good combination of fast cutting action with good chip clearance and a relatively smooth finish.

| BLADE | WIDTH | THICKNESS | TEETH/INCH | |
|---|---|---|---|---|
| #2/0 | .022 | .010 | 28 | For extremely intricate sawing. Very tight cuts in 1/16" - 1/4" wood veneer, plastic, hard rubber, pearl, etc. |
| #0 | .024 | .011 | 25 | |
| #2 | .029 | .012 | 20 | For tight radius work with thin materials, 3/32" - 1/2" wood veneer, wood, bone, fiber, plastic, etc. |
| #4 | .035 | .015 | 15 | |
| #5 | .038 | .016 | 12.5 | For close radius work in materials 1/8" or thicker. Good for sawing hard and soft woods, bone, horn, plastic, etc. |
| #6 | .041 | .016 | 12.5 | |
| #7 | .045 | .017 | 11.5 | Popular sizes for cutting hard and soft woods, 3/16" up to 2". Also cuts plastic, paper, felt, bone, etc. |
| #9 | .053 | .018 | 11.5 | |
| #11 | .059 | .019 | 9.5 | |
| #12 | .062 | .024 | 9.5 | |

## REVERSE TOOTH

Reverse teeth at the bottom of the blades prevent splintering to the underside of the workpiece.

| BLADE | WIDTH | THICKNESS | TEETH/INCH | |
|---|---|---|---|---|
| #2/0R | .026 | .011 | 28/20 | Same applications as Skip Tooth blades. |
| #2R | .029 | .012 | 20/13 | |
| #5R | .038 | .016 | 12.5/9 | |
| #7R | .049 | .018 | 11.5/8 | |
| #9R | .054 | .019 | 11.5/8 | |
| #12R | .062 | .062 | 9.5/6 | |

## DOUBLE TOOTH

Fast, clean cutting and very efficient chip clearance.

| BLADE | WIDTH | THICKNESS | TEETH/INCH | |
|---|---|---|---|---|
| #1D | .026 | .013 | 30 | Same applications as Skip Tooth blades. |
| #3D | .032 | .014 | 23 | |
| #5D | .038 | .016 | 16 | |
| #7D | .044 | .018 | 13 | |
| #9D | .053 | .018 | 11 | |
| #12D | .061 | .022 | 10 | |

**Blade storage**

There are 12 sockets (mounting holes) on either side of the base of the saw to hold blade storage "test tubes" (tubes not supplied). Most blade retailers sell blades either already in the tubes or will be able to sell spare tubes separately. Storing your spare blades in tubes, by size, right on the base of the machine can be a great way to organize your spare blades so that they are handy and available when needed.

# Choosing & Installing a Saw Blade

### Installing or changing blades

**Always turn off and unplug the machine before removing, handling or changing blades.**

1. Remove an installed, worn or broken blade by flipping the blade tension lever forward (position 1), then loosening the thumbscrews a and b on the upper and lower blade mounts c and d. (See Fig. 1 to 3)
2. Remove the blade.
3. With the blade teeth facing forward, slip one end of the blade through the hole in the table and fit each end of the blade into the corresponding upper and lower blade mounts, then tighten the thumbscrews firmly by hand only – do not use tools.
   ***Note: Overtightening the blade clamp thumbscrews can cause premature wear to the blades gripping surface and result in blade slippage.***
4. Push the blade tension lever back (position 2) to apply tension on the blade.

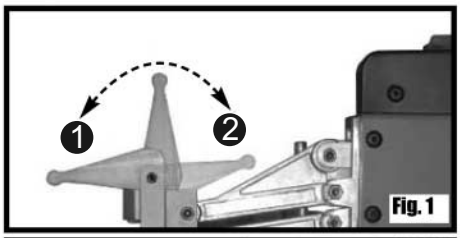


Fig. 1

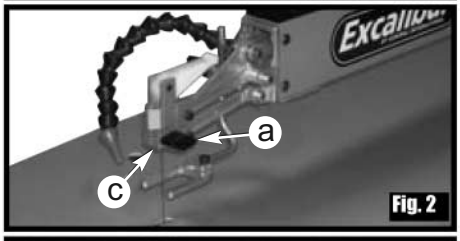


Fig. 2

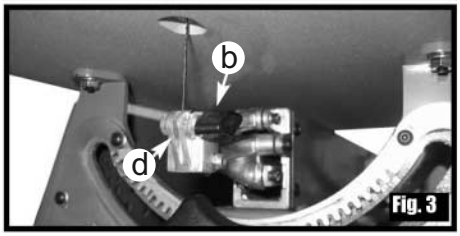


Fig. 3

***Helpful Hints on blade tension:*** *Determining correct blade tension is somewhat subjective. It is learned through experience and is somewhat dependant on personal preference. A properly tensioned blade will last longer and be much less likely to break prematurely. If the blade tension is too loose, you will notice that the blade will have a tendency to drift or slip off-line when cutting and you may also experience excessive vibration or unusual noise. A blade that is too tight will break prematurely.*

*Assuming the blade has been properly installed in the blade mounts, when the blade tension lever is pushed fully back towards the rear of the saw, the blade should be properly tensioned.*

Test the blade tension by lightly plucking on the blade, like you would a guitar string, with your finger. If the blade is tight and tensioned correctly you will get a clear and even note. If so, you are ready to proceed to operating and cutting with the saw.

### On/Off switch

A simple, dust protected rocker style on/off switch a is located on the top of the saw. (See Fig. 5)

### Adjusting the blade speed

The Ex-30 Scroll Saw is equipped with a variable blade speed control which allows you to select or fine-tune to the exact blade speed required (from 400-1550 strokes per minute) for best results based on the type and thickness of material and type of blade being used.

The blade speed control knob b is located on the top of the machine. (See Fig. 5)

- To increase blade speed, turn the control knob clockwise.
- To decrease blade speed turn the control knob counter clockwise.

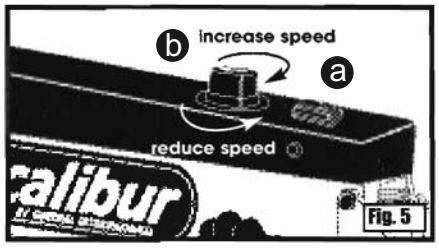


Fig. 5

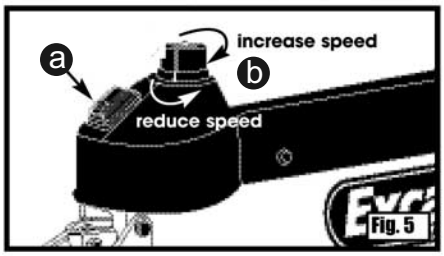


Fig. 5

# Operating Instructions

Blade speed selection is subjective and is dependant on a variety of factors: type and thickness of material being cut, type of blade being used, feed rate, required finish quality as well as experience, personal preference and comfort level of the user. There are no hard and fast rules. Be patient – practice and experience will be your best teacher.

Here are some general guidelines to consider when selecting/adjusting blade speed:

- For best results and smoothest most efficient cutting, always select the highest blade speed that you are comfort able using based on your experience and skill level.
- Generally speaking, harder or denser workpiece material requires slower blade speeds.
- Slower speeds also work better with very thin blades, or when cutting most metals as well as for brittle or delicate material such as fine veneers.
- Some wood species will have a tendency to burn quicker at higher blade speeds. To avoid additional sanding later, reduce blade speed and feed speed at the first signs of burn marks on the workpiece.

## Adjusting the Blower

The EX-21 EX-30 is equipped with a built-in blower to help clear cutting dust from the workpiece surface in front of the blade and on any reference lines. Adjust the blower tube (a) as needed to point the nozzle at the blade to set it at a comfortable distance so as not to obstruct your hand movement as you work. (See Fig. 6)

## Workpiece Hold-Down

The workpiece hold-down (b) (See Fig. 6) can be adjusted to assist in preventing the blade from lifting the workpiece up from the table during the cut. Loosen the thumbscrew (c) to set the height to your convenience based on the thickness of the workpiece. Before cutting, test to make sure that the hold-down is not adjusted too tightly to the workpiece or that it obstructs the movement of the workpiece.

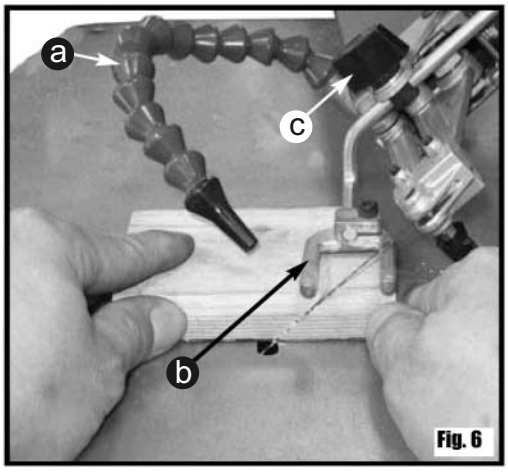


Fig. 6

## Adjusting the Osolation (Front to Back)

Fig A

Fig B

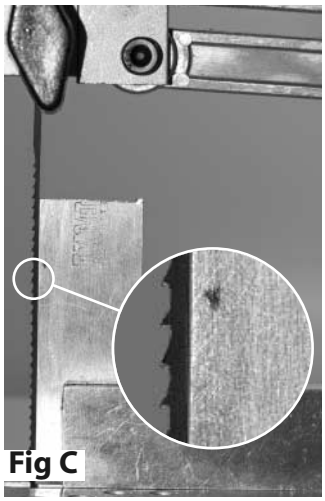


Fig C

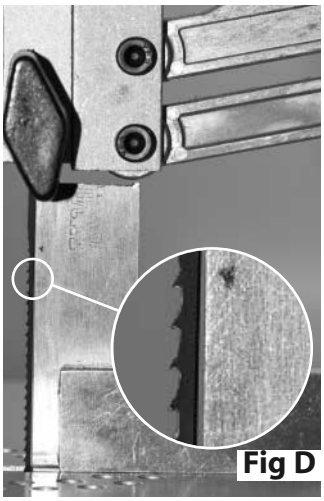


Fig D

Place a 90˚ square upagainst the blade, the blade movement can be set between course and fine for different cutting tasks, this can be adjusted by rotating the motor within its' mounts. Loosen the motor mounting cap head bolts, see figs A enough to be able to rotate the motor (this can be quite stiff to turn), start the machine and run at approximately 1/4 speed. By rotating the motor, see fig B and carefully observing the blade you will be able to see the blade changing its setting. The finest setting is where the blade moves vertically with the least amount of movement, see fig C backward and forwards horizontally. This should also be where the machine vibrates the least. When you have the setting where you wish it to be, tighten the motor mounting bolts.

## Top & Bottom Blade holder Alignment

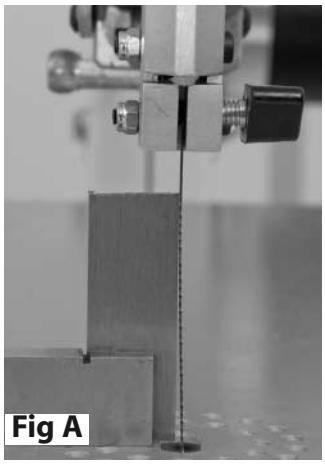


Fig A

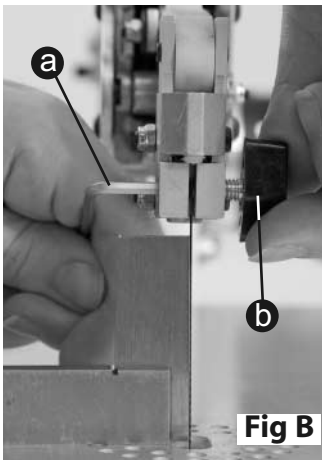


Fig B

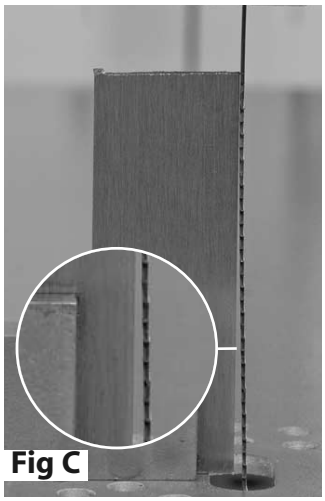


Fig C

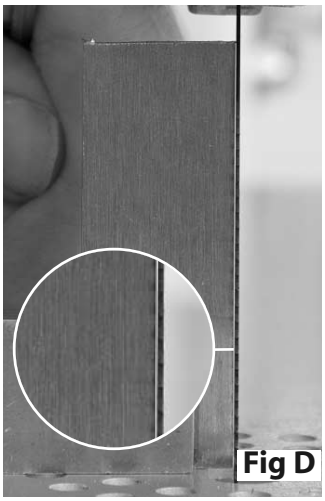


Fig D

**If the blade is out of alignment please follow the procedures below for adjusting the top and bottom blade holders:**

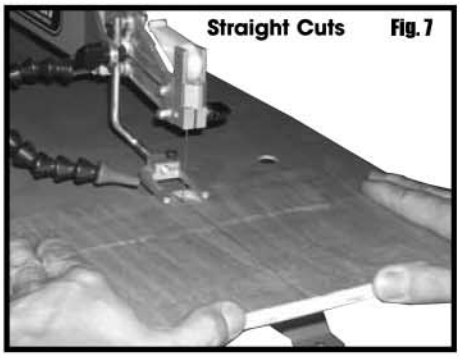
Place a 90˚ square upagainst the blade, see fig A. Using a 4mm Hex key **(a)** adjust the grub screw and butterfly nut **(b)**, see fig B, until the blade is parallel with the square. (See figs C and D).

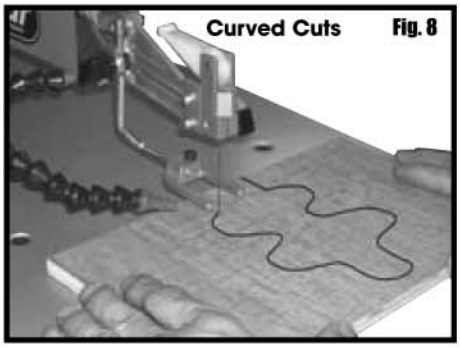
## Basic 90° straight or curved cuts

All cuts made with the blade at 90° to the table follow the same basic principals. Start by marking or transferring your pattern or reference lines onto you workpiece.

***Note: The EX-30 has a 30" throat that allow for a workpiece of up to 30" of clearance to swing completely around without hitting the back of the saw. If necessary, rough-cut the workpiece down to a workable size before starting intricate work on the scroll saw.*** **The above note applys also to the EX-16 (16") and EX-21 (21") scroll saws.**

1. With the saw turned off and unplugged, install the appropriate blade for the type of material to be cut and the type of cut to be made (Refer to the section "Choosing and Installing a Saw Blade" on page 9).
2. Adjust the workpiece hold-down and the blower nozzle to your liking.
3. Turn on the saw and set the speed controller to the desired blade speed.
4. With your fingers holding the piece firm to the table, and using your thumbs for directional control, (See Fig #7 & 8) feed the workpiece into the blade using steady, even pressure.
5. Make sure that the blade is cutting on the waste side of your reference line and adjust feed direction slighty as needed to compensate for blade drift.


Straight Cuts Fig. 7


Curved Cuts Fig. 8

***Cutting Tips: To stay in control on tight curve cuts, slow down your feed rate as needed to allow the blade teeth time to make the cut. Avoid coming to a complete stop whenever possible as this can leave burn marks on the workpiece and also makes it more difficult to get the piece re-started and moving through the cut again. Avoid forcing through a curve cut as this can cause the blade to twist and cut off-track or may even cause the blade to break.***

## Fret Cutting

Fret or inside cutting is an operation that can only be performed on a scroll saw. Fret cutting involves drilling a small guide or pilot hole through the interior of your pattern on the workpiece, then disconnecting one end of the blade which is fitted through the guide hole and re-connected; essentially using this guide hole as the starting point to cut out the piece from within. A typical example of fret cutting would be removing the center portion of lettering. (See Fig. 9)

The EX-21 EX-30 is a great tool for fret cutting because, unlike most scroll saws it allows you to raise the upper arm with the blade attached, line up the guide hole in your workpiece with the hole in the table and then lower the arm while guiding the blade through the hole from above (see step by step instructions below). This can be a very useful time saving feature, particularly for intricate or complex fret designs that can involve dozens or even hundreds of holes.

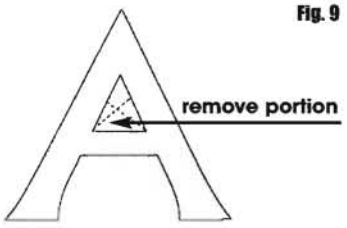


Fig. 9

***Note: The upper arm locks in place in the raised position for easier insertion of the blade through the hole in the workpiece and for easier blade changes.***

1. With the saw turned off and unplugged, install the appropriate blade for the type of material to be cut and the type of cut to be made (Refer to the section "Choosing and Installing a Saw Blade" on page 9 of this manual).
2. With your pattern or design transferred onto the workpiece, drill a guide hole in the inside waste portion of the workpiece. (See Fig. 10) Make sure that the hole is large enough for the blade to fit through.

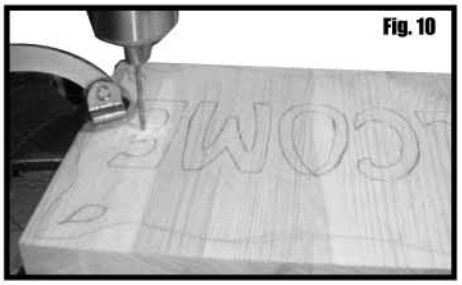


Fig. 10

***Helpful hints on drilling guide holes: If multiple fret cuts are required on the same workpiece, drill all of your required guide holes before taking the workpiece to the scroll saw. This will keep you from going back and forth from the saw to the drill press.***

***To prolong blade life by limiting unnecessary cutting, drill your guide holes as close as possible to your reference lines. (See Fig. 11)***

Fig. 11

3. Release tension on the blade by flipping the blade tension lever forward.
4. Loosen the thumbscrew on the lower blade mount, located under the table, to release the blade from the mount.
5. Raise the upper arm assembly which will lift the blade up through the hole and above the table.
6. Position the workpiece on the table so that the guide hole lines up with the hole in the table.
7. Lower the arm assembly with one hand while guiding the blade through the hole in the workpiece and table.
8. Re-install the bottom end of the blade in the lower blade mount and tighten the thumbscrew to secure the blade in the lower blade mount.
9. Flip back the blade tension lever to re-tension the blade and test the blade tension as described in "Installing or Changing Blades" section of this manual.
10. To begin cutting follow the same steps as described in "Basic 90° straight or curved cuts" section on page 9 of this manual.

**To reduce the risk of injury, always turn off the saw and wait for the blade to come to a complete stop before reaching in to remove waste material from a fret cut.**

## Angle or Bevel Cutting

One of the unique features of the EX-16 EX-21 EX-30 Scroll Saw is the ability to tilt the head of the saw in order to make angle or bevel cuts. The table and the workpiece always stay horizontal (parallel to the floor) while the blade tilts, keeping your hands in the same comfortable cutting position as they would normally be for regular right angle cuts. Because you are not fighting gravity or working with your hands or wrists bent in awkward positions, it can be a huge advantage and makes it easier and safer to make accurate bevel cuts.

The blade tilt controls are located under the table at the front saw. (See Fig. 12)

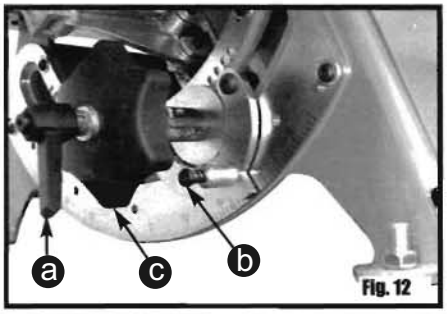


Fig. 12

To tilt the blade for bevel cutting:

1. Release the locking lever (a) by turning counter-clockwise.
2. Turn the tilting handle (c) left or right to set the blade to the desired angle.

***Note: Push in and hold the spring loaded indexing pin (b) to locate the following common angles: 90°, 45°, 30° & 22.5° both left and right.***

***When tilting the blade to the left at extreme angles, it may be necessary to remove and reverse the lower blade mount thumbscrew assembly in order to maximize clearance under the table. (Fig. 13 shows the lower blade mount in default position and Fig. 14 shows it reversed).***

***To avoid kinking or damaging the blade in the holder, when making adjustments make sure the set screw (d) (opposite the thumbscrew (e)) is threaded in to the holder to protrude slightly beyond the blade slot (f). (See Fig. 15)***

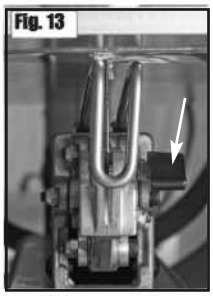


Fig. 13

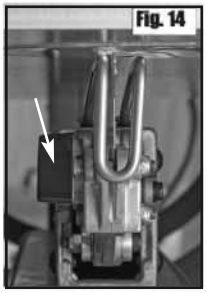


Fig. 14

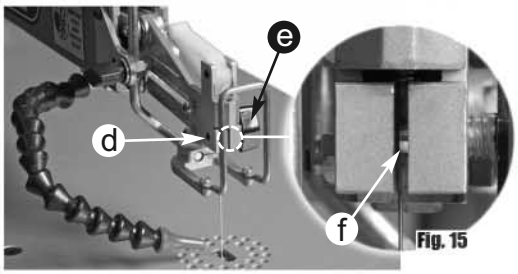


Fig. 15

3. Tighten the locking lever (a) to secure the blade at the desired angle.
4. To begin cutting follow the same steps as described in "Basic 90° straight or curved cuts" section on page 11 of this manual. Fig. 16 shows the scroll saw in position for bevel cutting.

**To reduce the risk of injury, always turn off the saw and wait for the blade to come to a complete stop before reaching in to remove waste material.**

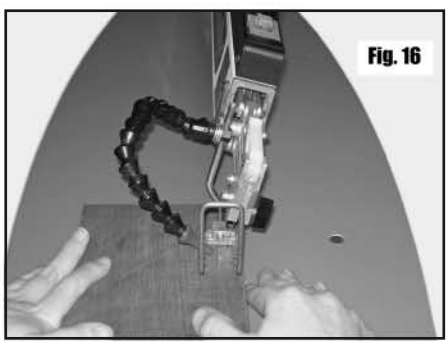
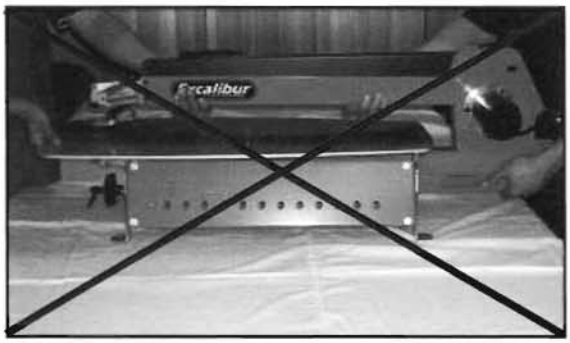


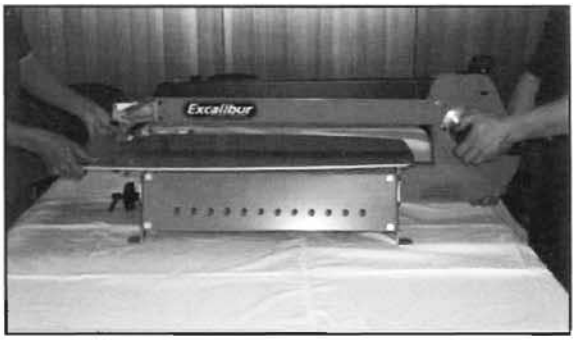
Fig. 16

# Maintenance, Adjustments & Servicing

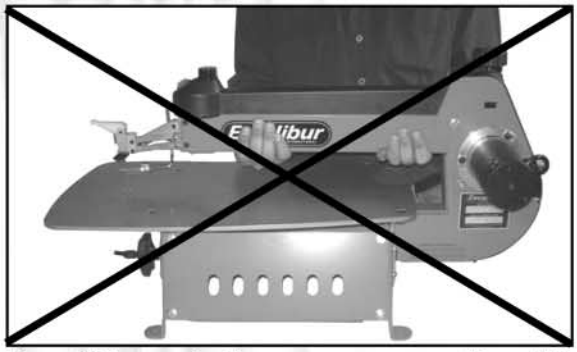
## Handling



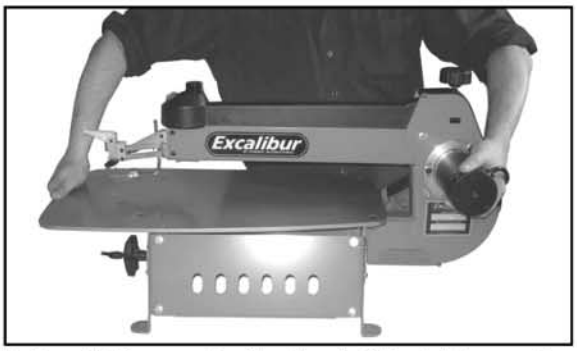

Never lift the saw by the upper arm assembly as this will result in damage to the drivetrain.




Rather lift the saw by the front of the table and by the motor.



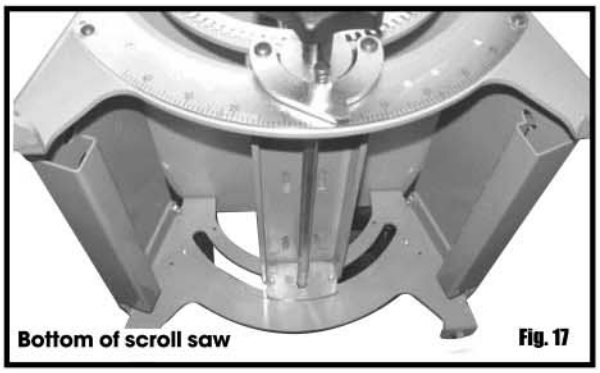
Never lift the saw by the upper arm assembly as this will result in damage to the drivetrain.




Rather lift the saw by the front of the table and by the motor.

## Maintenance

- Always release tension on the blade when the saw is not in use.
- Clean the saw regularly with a soft bristle brush or by vacuuming to keep cutting dust from accumulating.
- An occasional application of a light dab of grease on the front and rear trunnions (See Fig. 17) will keep the tilting mechanism working smoothly. If you find the tilting mechanism becoming more difficult to operate, thoroughly wipe off any built-up cutting dust on the trunnions and re-apply a little grease.
- The bearings in the drive mechanism are sealed and permanently lubricated and do not need to be oiled or greased.

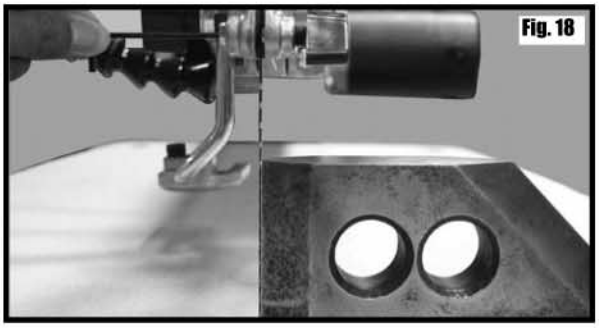


Bottom of scroll saw — Fig. 17

## Squaring the blade to the table

Depending on frequency of use and how much the tilting mechanism is used, normal wear will over time cause the blade to come slightly out of alignment with the table. Periodically check the blade is square with the table. When needed, adjust as described in the following steps to re-align the blade square to the table.

1. Turn off and unplug the saw.
2. Using the blade tilt controls at the front of the saw, set the blade angle to read 0 - which is 90° vertical to the table.
3. Set a machinists square on the table and against the blade to verify the blade angle. (See Fig. 18)
4. If the blade angle requires adjustment loosen the 4 bolts in the front trunnion (a) as well as the 4 bolts on the rear trunnions (b).
5. By hand, move the entire head to bring the blade square to the table.
6. With the blade square to the table hold the head in position and re-tighten the bolts on the front and rear trunnions.

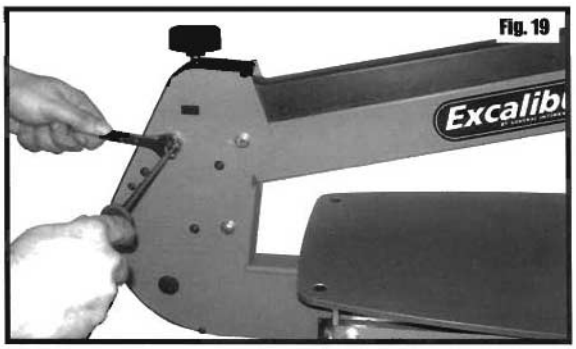


**Upper arm tension adjustment**

Over time and with normal wear, the upper arm tension will require adjustment to hold the arm in the raised position.

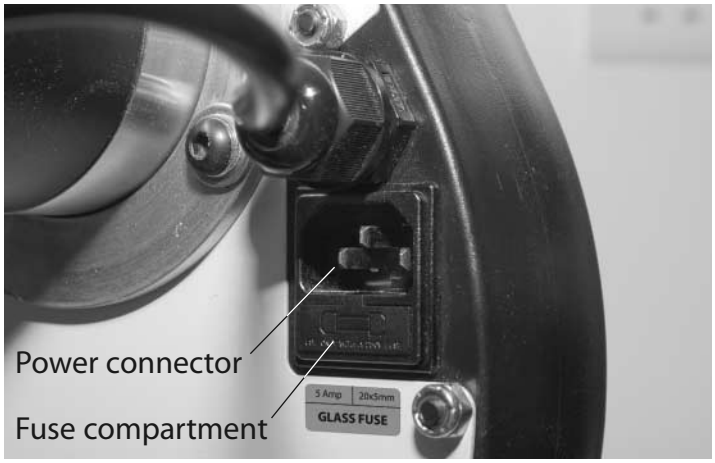
To adjust the upper arm tension:

1. Loosen the lock nut. (See Fig. 19)
2. Adjust the tension screw until the arm stays in raised position.
3. Re-tighten the lock nut.




## Changing the Fuse

The Excalibur scroll saws takes a 5 Amp 20 x 5mm glass fuse, follow the instrctions below on how to change the fuse.




**1.** Unplug the scroll saw from the mains

**2.** Using a screwdriver un-clip the fuse compartment assembly, situated below the power connector

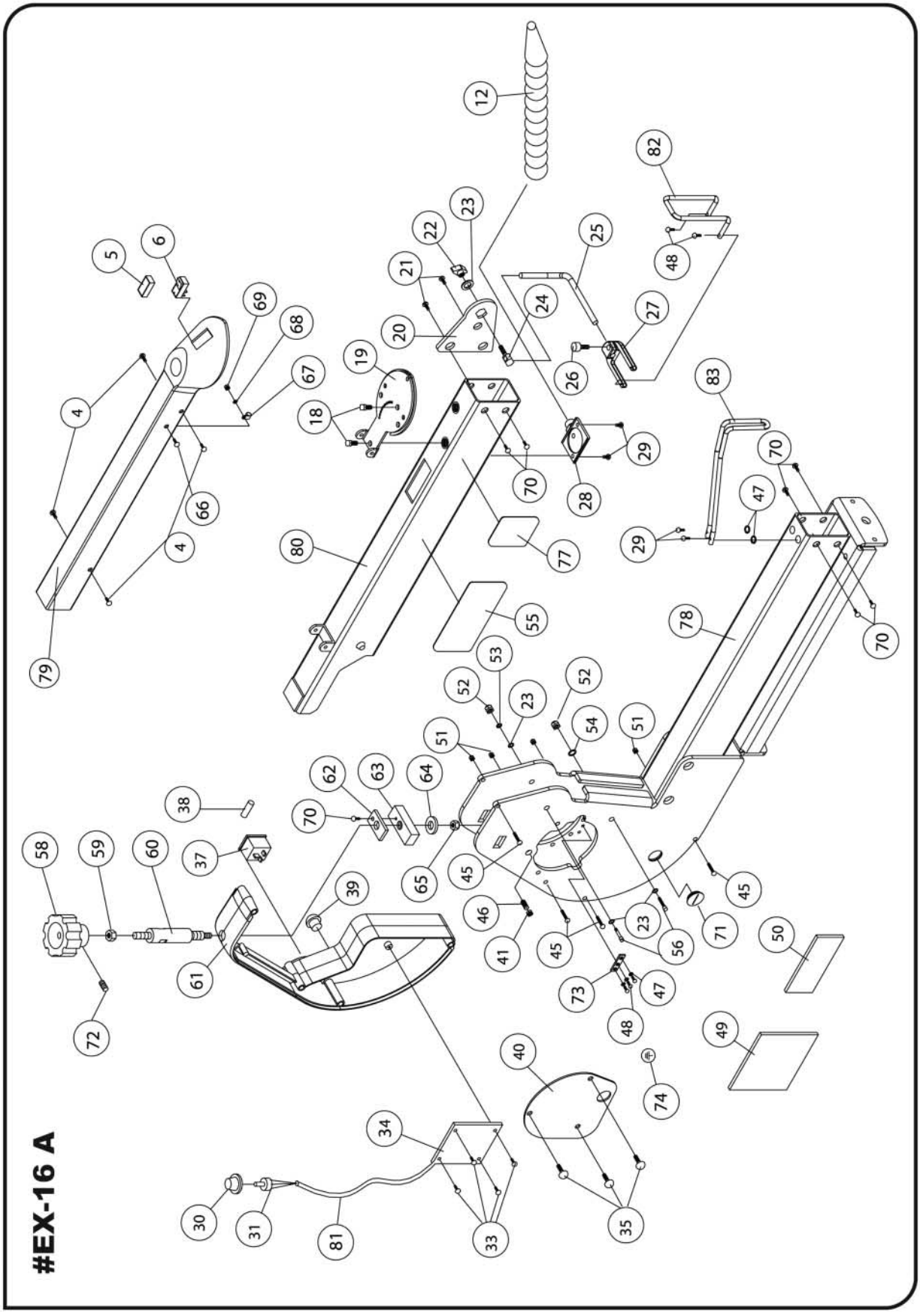
**3.** Remove the fuse from it's compartment and replace it with a new one

**4.** Re-insert the fuse assembly until it clips home

## Specifications

| Code | 953432 | 950006 | 950007 |
|---|---|---|---|
| Model | EX-16 | EX-21 | EX-30 |
| Rating | Trade | Trade | Trade |
| Power | 230V 50Hz 320W | 230V 50Hz 320W | 230V 50Hz 320W |
| Throat | 406mm | 535mm | 762mm |
| Stroke | 18mm | 18mm | 18mm |
| Cuts per Minute | 400 -1,400 | 400 -1,400 | 400-1,400 |
| Max Depth of Cut | 51mm | 51mm | 51mm |
| Table Size | 305 x 470mm | 345 x 597mm | 358 x 825mm |
| Arm Tilt | Left 35° Right -45° | Left 35° Right -45° | Left 35° Right -45° |
| Overall L x W x H | 686 x 380 x 432mm | 812 x 380 x 387mm | 1,100 x 394 x 387mm |
| Weight | 24.5kg | 29.5kg | 52kg |

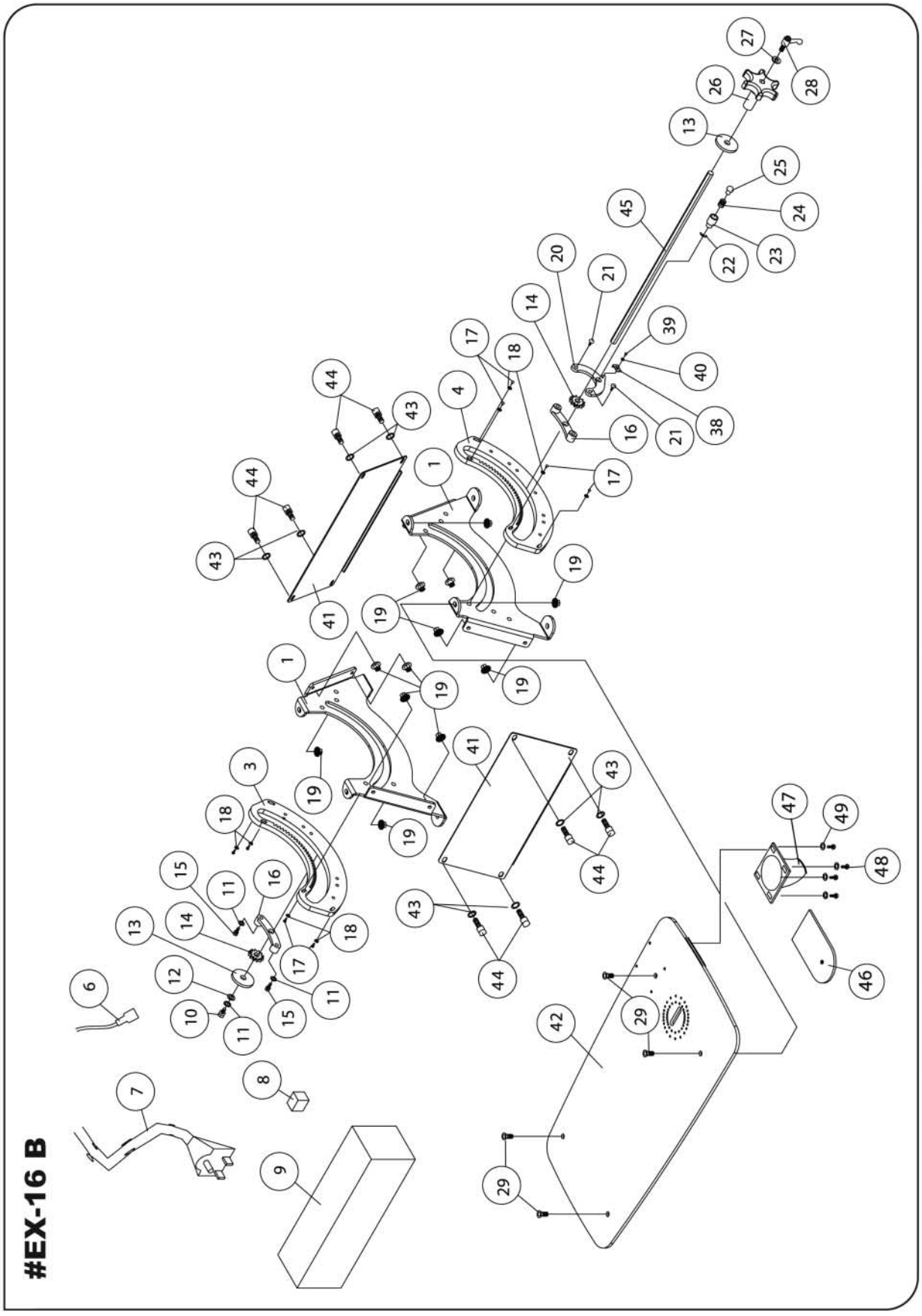
# EX-16 Parts Breakdown (A)



## PARTS LIST - EX-16CE (A)

| PART NO. | DESCRIPTION | SPECIFICATION | QTY |
|---|---|---|---|
| EX16-A04 | ALLEN SCREW | #10-32 X 1/4" | 4 |
| EX16-A05 | SWITCH COVER | | 1 |
| EX16-A06 | SWITCH | | 1 |
| EX16-A12 | AIR NOZZLE | | 1 |
| EX16-A18 | BOLT | 1/4-20 X 1/2" | 2 |
| EX16-A19 | UPPER & LOWER TENSION PLATE | | 1 |
| EX16-A20 | HOLD DOWN MOUNT PLATE | | 1 |
| EX16-A21 | ALLEN SCREW | #10-32 X 3/8" | 2 |
| EX16-A22 | HOLD DOWN CLAMP KNOB | | 1 |
| EX16-A23 | WASHER | 1/4 X 16 X 1.8" | 4 |
| EX16-A24 | HOLD DOWN CLAMP SCREW | | 1 |
| EX16-A25 | HOLD DOWN BAR | | 1 |
| EX16-A26 | CAP SCREW | #10-32 X 1/2" | 1 |
| EX16-A27 | HOLD DOWN FORKS | | 1 |
| EX16-A28 | DUST BLOWER | | 1 |
| EX16-A29 | TAP SCREW | #8-32UNF 3/8" | 4 |
| EX16-A30 | VR KNOB | | 1 |
| EX16-A31 | VR | | 1 |
| EX16-A33 | SCREW | M4 X 8 | 4 |
| EX16-A34 | MOTOR CONTROL SET | | 1 |
| EX16-A35 | ALLEN SCREW | 1/4-20 X 1/2 " | 3 |
| EX16-A37 | LINE CORD SOCKET | | 1 |
| EX16-A38 | FUSE | | 1 |
| EX16-A39 | STRAIN RELIEF | | 1 |
| EX16-A40 | GEAR COVER | | 1 |
| EX16-A41 | NUT | 3/8 X T5.5 | 1 |
| EX16-A45 | ALLEN SCREW | #10-32 X 2-1/4" | 4 |
| EX16-A46 | SCREW | 3/8" X 5/8" | 1 |
| EX16-A47 | WASHER | #8 | 5 |
| EX16-A48 | SCREW | #8-32 X 1/4" | 5 |
| EX16-A49 | MOTOR LABEL | | 1 |
| EX16-A50 | WARNING LABEL | | 1 |
| EX16-A51 | NYLON NUT | #10-32 | 4 |
| EX16-A52 | NYLON NUT | 1/4-20UNC | 2 |
| EX16-A53 | LOCK WASHER | 1/4" | 1 |
| EX16-A54 | FLAT WASHER | 1/4" (O.D.13) | 1 |
| EX16-A55 | LABEL | | 2 |
| EX16-A56 | SCREW | 1/4 X 2-1/2" | 2 |
| EX16-A58 | KNOB | | 1 |
| EX16-A59 | NUT | M6 | 1 |
| EX16-A60 | ADJUSTING LEVER | | 1 |
| EX16-A61 | CONTROL BOX | | 1 |
| EX16-A62 | CROSS BLOCK RETAINER | | 1 |
| EX16-A63 | HOUSING CROSS BLOCK | | 1 |
| EX16-A64 | FLAT WASHER | M6 X 16 X 2 | 1 |
| EX16-A65 | NYLON NUT | M6 | 1 |
| EX16-A66 | ALLEN SCREW | | 1 |
| EX16-A67 | R FASTENER | | 1 |
| EX16-A68 | WASHER | | 1 |
| EX16-A69 | NYLON NUT | | 1 |
| EX16-A70 | ALLEN SCREW | | 7 |
| EX16-A71 | BUTTON | | 1 |
| EX16-A72 | SET SCREW | | 1 |
| EX16-A73 | GROUND PLATE | | 1 |
| EX16-A74 | GROUND LABEL | | 1 |
| EX16-A77 | LABEL | | 1 |
| EX16-A78 | MAIN BODY | | 1 |
| EX16-A79 | TOP COVER | | 1 |
| EX16-A80 | UPPER ARM | | 1 |
| EX16-A81 | CONTROL CABLE | | 1 |
| EX16-A82 | UPPER BLADE GUARD | | 1 |
| EX16-A83 | LOWER BLADE GUARD | | 1 |

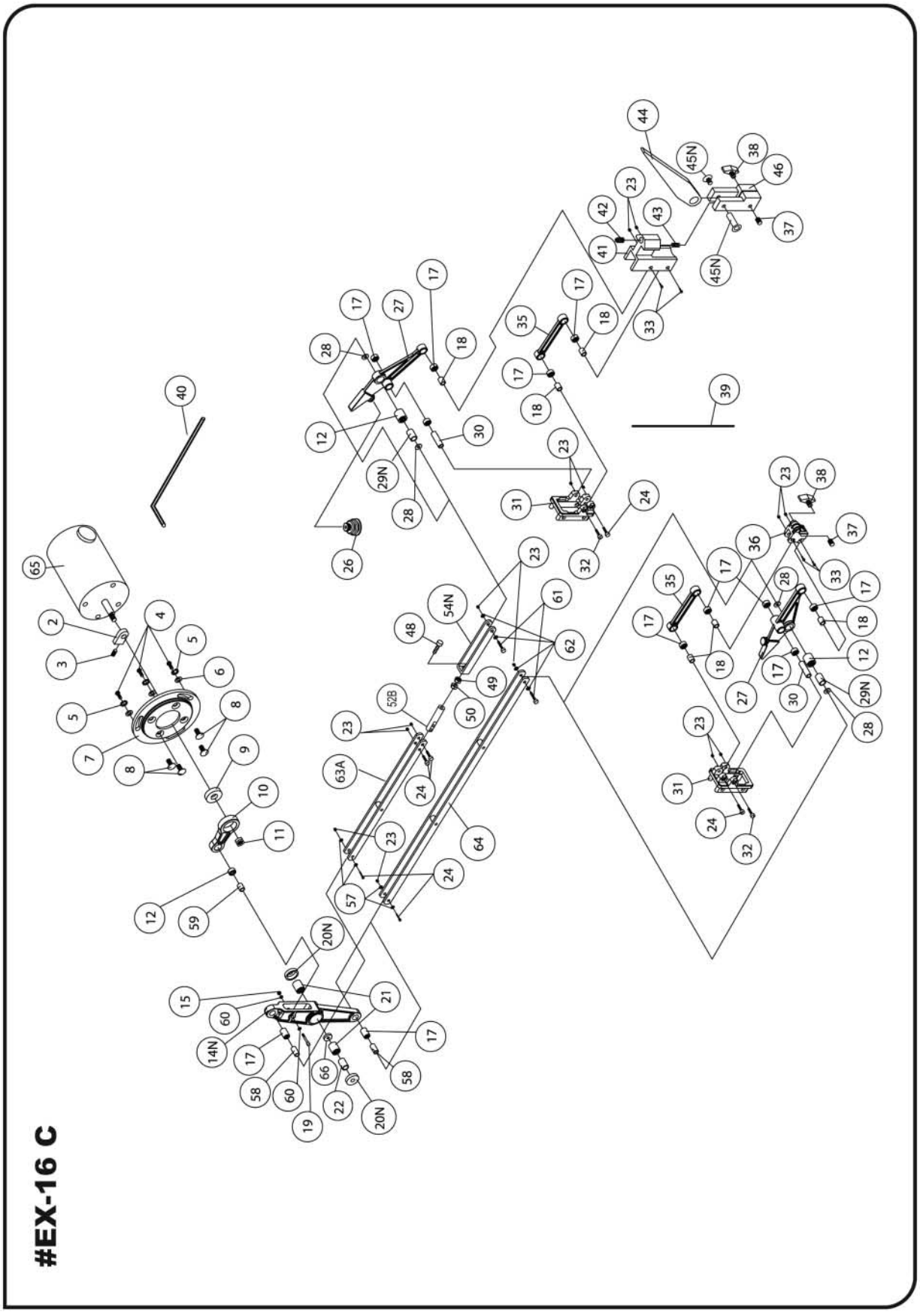
# EX-16 Parts Breakdown (B)



## PARTS LIST - EX-16CE (B)

| PART NO. | DESCRIPTION | SPECIFICATION | QTY |
|---|---|---|---|
| EX16-B01 | TRUNNION | | 2 |
| EX16-B03 | REAR TRUNNION PLATE | | 1 |
| EX16-B04 | FRONT TRUNNION PLATE | | 1 |
| EX16-B06 | GROUND JUMPER | | 1 |
| EX16-B07 | POWER CORD | CSA | 1 |
| EX16-B08 | SPONG BLOCK | | 1 |
| EX16-B09 | POLYFOAM | | 1 |
| EX16-B10 | SCREW | 1/4-20UNC X 1/2 | 1 |
| EX16-B11 | LOCK WASHER | 1/4 | 3 |
| EX16-B12 | WASHER | 1/4 | 9 |
| EX16-B13 | BLADE TILT WASHER | | 2 |
| EX16-B14 | BLADE TILT DRIVE GEAR | | 2 |
| EX16-B15 | SCREW | 1/4-20UNC X 3/4 | 10 |
| EX16-B16 | ANGLE FOLLOWER | | 2 |
| EX16-B17 | SCREW | #10-32 X 5/16 | 8 |
| EX16-B18 | WASHER | #10 X 12 X 1 | 8 |
| EX16-B19 | NUT | 1/4-20UNC | 12 |
| EX16-B20 | ANGLE INDICATOR | | 1 |
| EX16-B21 | ALLEN SCREW | 1/4-20 X 1" | 2 |
| EX16-B22 | E RING | ETW-3 | 1 |
| EX16-B23 | TILT DETENT BARREL | | 1 |
| EX16-B24 | SPRING | | 1 |
| EX16-B25 | DETENT PLUNGER | | 1 |
| EX16-B26 | TILT HANDLE | | 1 |
| EX16-B27 | WASHER | 1/4 X 16 X 3 | 1 |
| EX16-B28 | BLADE TILT LOCKING LEVER | | 1 |
| EX16-B29 | FLAT HEAD SCREW | 1/4-20 X 3/4 | 4 |
| EX16-B38 | POINTER | | 1 |
| EX16-B39 | ROUND HEAD SCREW | M4 X 6MM | 1 |
| EX16-B40 | WASHER | M4 | 1 |
| EX16-B41 | SIDE PANEL | | 2 |
| EX16-B42 | TABLE | | 1 |
| EX16-B43 | WASHER | 1/4. | 8 |
| EX16-B44 | ALLEN SCREW | 1/4-20UNC X 3/4 | 8 |
| EX16-B45 | TILT LOCK DRAW ROD | | 1 |
| EX16-B46 | COVER | | 1 |
| EX16-B47 | DUST CHUT | | 1 |
| EX16-B48 | ROUND HEAD SCREW | #8-32unc-5/16 | 4 |
| EX16-B49 | WASHER | #8-32unc | 4 |

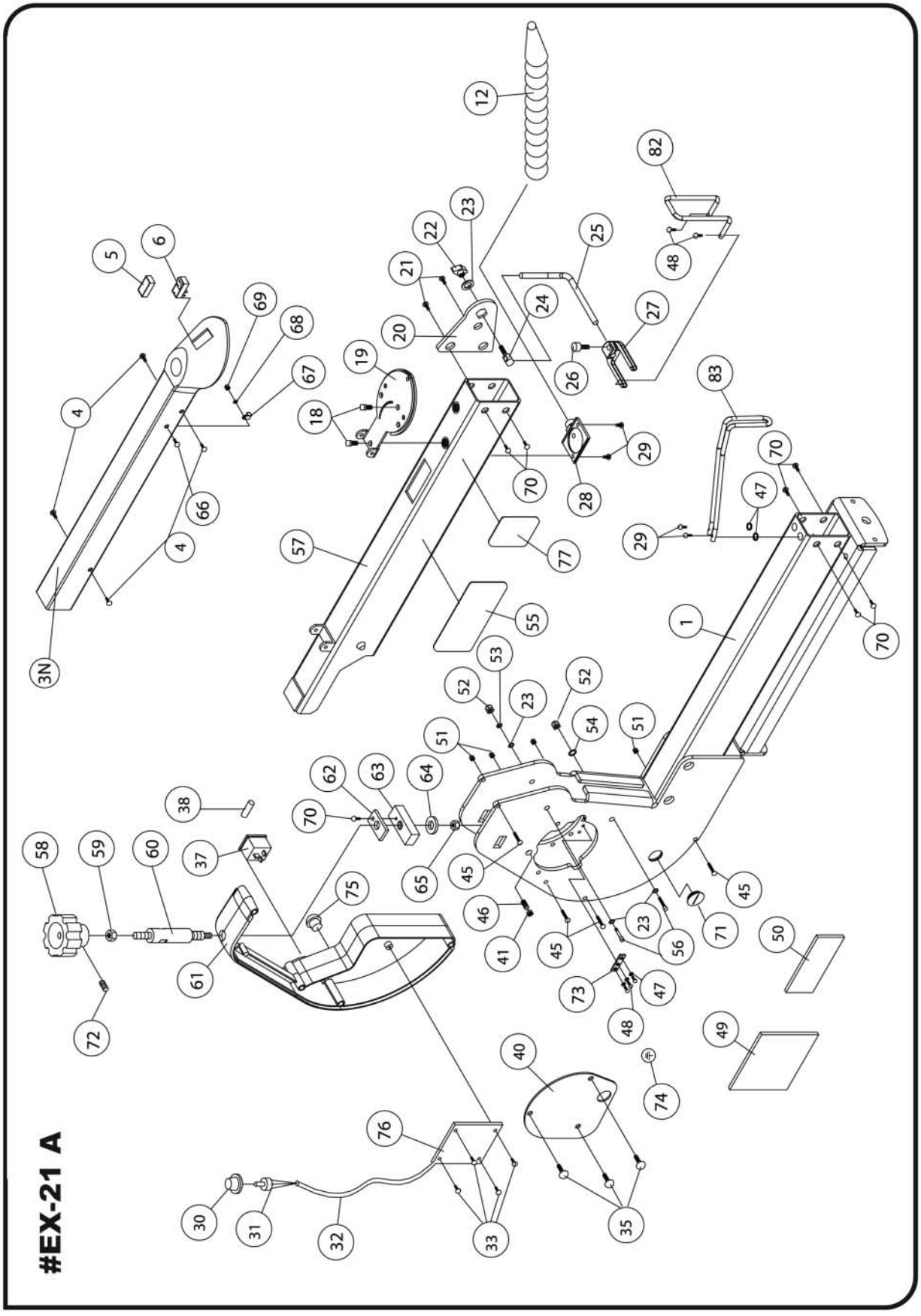
# EX-16 Parts Breakdown (C)



## PARTS LIST - EX-16CE (C)

| PART NO. | DESCRIPTION | SPECIFICATION | QTY |
|---|---|---|---|
| EX16-C02 | BALANCE BLOCK | | 1 |
| EX16-C03 | SET SCREW | M6 X 6 | 1 |
| EX16-C04 | ALLEN SCREW | 1/4-20 X 1/ 2 | 3 |
| EX16-C05 | LOCK WASHER | 1/ 4. | 3 |
| EX16-C06 | FLAT WASHER | 1/4 X 16 X 1.8 | 3 |
| EX16-C07 | MOTOR COVER PLATE | | 1 |
| EX16-C08 | SCREW | M6 X 16 | 4 |
| EX16-C09 | BEARING | 608ZZ | 1 |
| EX16-C10 | MOTOR CAM | | 1 |
| EX16-C11 | NUT | M8 X P1.25 LH | 1 |
| EX16-C12 | BEARING | 810 | 3 |
| EX16-C14N | ROCKER CAM | | 1 |
| EX16-C15 | LOCK NUT | M5 | 1 |
| EX16-C17 | BEARING | 0609 | 12 |
| EX16-C18 | BEARING INNER SLEEVE (SHORT) | | 6 |
| EX16-C19 | CAP SCREW | M5 X 28 | 1 |
| EX16-C20N | BEARING COVER | | 2 |
| EX16-C21 | BEARING | 1412 | 2 |
| EX16-C22 | MAIN ROCKER PIVOT | | 1 |
| EX16-C23 | NUT | M4 | 14 |
| EX16-C24 | CAP SCREW | M4 X 25 | 6 |
| EX16-C26 | AIR PUMP BELLOWS | | 1 |
| EX16-C27 | FRONT ROCKER | | 2 |
| EX16-C28 | WASHER | M8 X 15 X 0.6 | 4 |
| EX16-C29N | INNER BEARINGR SLEEVE - FRONT ROCKER | Ø8.03 X 18.40MM | 2 |
| EX16-C30 | BEARING INNER SLEEVE (LONG) | | 2 |
| EX16-C31 | ROCKER MOUNT | | 2 |
| EX16-C32 | CAP SCREW | M4 X 40 | 2 |
| EX16-C33 | CAP SCREW | M4 X 22 | 6 |
| EX16-C35 | STRUT | | 4 |
| EX16-C36 | BLADE CHUCK | | 1 |
| EX16-C37 | SET SCREW | M6X8 | 2 |
| EX16-C38 | BLADE CLAMP THUMB SCREW | | 2 |
| EX16-C39 | BLADE | | 1 |
| EX16-C40 | ALLEN KEY | 3MM | 1 |
| EX16-C41 | CLAMP BRACKET | | 1 |
| EX16-C42 | SET SCREW | 1/ 4-20UNC | 1 |
| EX16-C43 | SPRING | | 1 |
| EX16-C44 | TENSION LEVER | 5MM | 1 |
| EX16-C45N | SCREW POST | 5 X 18 | 1 |
| EX16-C46 | SLIDING BRACKET | | 1 |
| EX16-C48 | CAP SCREW | M6 | 1 |
| EX16-C49 | LOCK NUT | M6 | 1 |
| EX16-C50 | NUT | M6 | 1 |
| EX16-C52B | LINK NUT | | 1 |
| EX16-C54N | DRIVE LINK ASS'Y (SHORT) | | 1 |
| EX16-C57 | WASHER | M4 | 4 |
| EX16-C58 | INNER BEARING SLEEVE (LONG) | Ø6.02 X 16.50MM | 2 |
| EX16-C59 | BEARING INNER SLEEVE | M6 | 1 |
| EX16-C60 | WASHER | M5 | 2 |
| EX16-C61 | CAP SCREW | M4 X 27 | 2 |
| EX16-C62 | WASHER | M4 | 4 |
| EX16-C63A | DRIVE LINK ASS'Y (MEDIUM) | | 1 |
| EX16-C64 | DRIVE LIN K ASS'Y (LONG) | | 1 |
| EX16-C65 | MOTOR | | 1 |
| EX16-C66 | SPACER | | 1 |

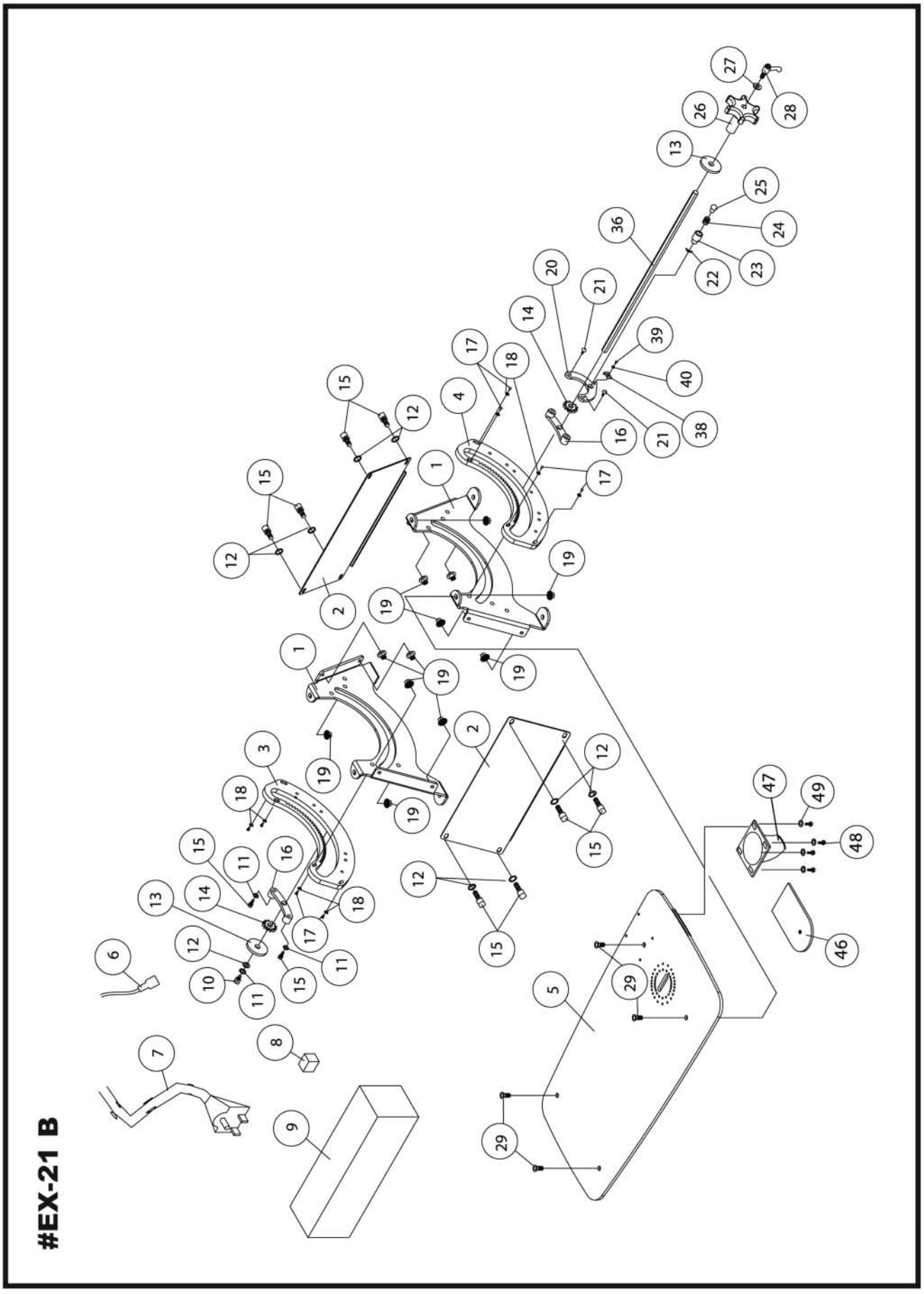
# EX-21 Parts Breakdown (A)



## PARTS LIST - EX-21CE (A)

| PART NO. | DESCRIPTION | SPECIFICATION | QTY |
|---|---|---|---|
| EX21-A01 | MAIN BODY | | 1 |
| EX21-A03N | TOP COVER | | 1 |
| EX21-A04 | ALLEN SCREW | #10-32 X 1/4" | 4 |
| EX21-A05 | SWITCH COVER | | 1 |
| EX21-A06 | SWITCH | | 1 |
| EX21-A12 | AIR NOZZLE | | 1 |
| EX21-A18 | BOLT | 1/4-20 X 1/2" | 2 |
| EX21-A19 | UPPER & LOWER TENSION PLATE | | 1 |
| EX21-A20 | HOLD DOWN MOUNT PLATE | | 1 |
| EX21-A21 | ALLEN SCREW | #10-32 X 3/8" | 2 |
| EX21-A22 | HOLD DOWN CLAMP KNOB | | 1 |
| EX21-A23 | WASHER | 1/4 X 16 X 1.8" | 4 |
| EX21-A24 | HOLD DOWN CLAMP SCREW | | 1 |
| EX21-A25 | HOLD DOWN BAR | | 1 |
| EX21-A26 | CAP SCREW | #10-32 X 1/2" | 1 |
| EX21-A27 | HOLD DOWN FORKS | | 1 |
| EX21-A28 | DUST BLOWER | | 1 |
| EX21-A29 | TAP SCREW | #8-32UNF 3/8" | 4 |
| EX21-A30 | VR KNOB | | 1 |
| EX21-A31 | VR | | 1 |
| EX21-A32 | CONTROL CABLE | | 1 |
| EX21-A33 | SCREW | M4 X 8 | 4 |
| EX21-A35 | ALLEN SCREW | 1/4-20 X 1/2 " | 3 |
| EX21-A37 | LINE CORD SOCKET | | 1 |
| EX21-A38 | FUSE | 5AMP | 1 |
| EX21-A40 | GEAR COVER | | 1 |
| EX21-A41 | NUT | 3/8 X T5.5 | 1 |
| EX21-A45 | ALLEN SCREW | #10-32 X 2-1/4" | 4 |
| EX21-A46 | SCREW | 3/8" X 5/8" | 1 |
| EX21-A47 | WASHER | #8 | 5 |
| EX21-A48 | SCREW | #8-32 X 1/4" | 5 |
| EX21-A49 | MOTOR LABEL | | 1 |
| EX21-A50 | WARNING LABEL | | 1 |
| EX11-A51 | NYLON NUT | #10-32 | 4 |
| EX21-A52 | NYLON NUT | 1/4-20UNC | 2 |
| EX21-A53 | LOCK WASHER | 1/4" | 1 |
| EX21-A54 | FLAT WASHER | 1/4" (O.D.13) | 1 |
| EX21-A55 | LABEL | | 2 |
| EX21-A56 | SCREW | 1/4 X 2-1/2" | 2 |
| EX21-A57 | UPPER ARM | | 1 |
| EX21-A58 | KNOB | | 1 |
| EX21-A59 | NUT | M6 | 1 |
| EX21-A60 | ADJUSTING LEVER | | 1 |
| EX21-A61 | CONTROL BOX | | 1 |
| EX21-A62 | CROSS BLOCK RETAINER | | 1 |
| EX21-A63 | HOUSING CROSS BLOCK | | 1 |
| EX21-A64 | FLAT WASHER | M6 X 16 X 2 | 1 |
| EX21-A65 | NYLON NUT | M6 | 1 |
| EX21-A66 | ALLEN SCREW | | 1 |
| EX21-A67 | R FASTENER | | 1 |
| EX21-A68 | WASHER | | 1 |
| EX21-A69 | NYLON NUT | | 1 |
| EX21-A70 | ALLEN SCREW | | 7 |
| EX21-A71 | BUTTON | | 1 |
| EX21-A72 | SET SCREW | | 1 |
| EX21-A73 | GROUND PLATE | | 1 |
| EX21-A74 | GROUND LABEL | | 1 |
| EX21-A75 | STRAIN RELIEF | | 1 |
| EX21-A76 | MOTOR CONTROL SET | | 1 |
| EX21-A77 | LABEL | | 1 |
| EX21-A82 | UPPER BLADE GUARD | | 1 |
| EX21-A83 | LOWER BLADE GUARD | | 1 |

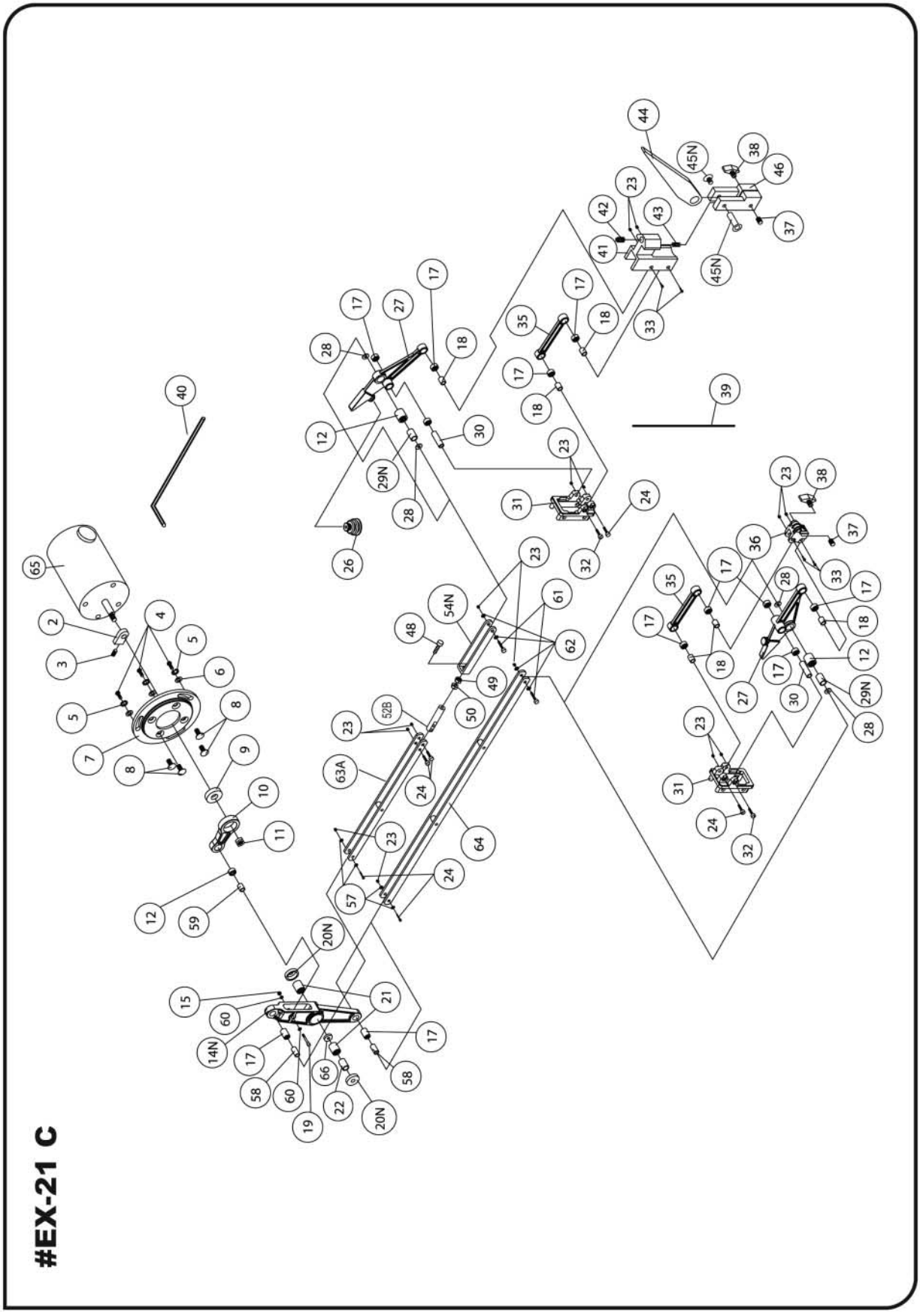
# EX-21 Parts Breakdown (B)



## PARTS LIST - EX-21CE (B)

| PART NO. | DESCRIPTION | SPECIFICATION | QTY |
|---|---|---|---|
| EX21-B01 | TRUNNION | | 2 |
| EX21-B02 | SIDE PANEL | | 2 |
| EX21-B03 | REAR TRUNNION PLATE | | 1 |
| EX21-B04 | FRONT TRUNNION PLATE | | 1 |
| EX21-B05 | TABLE | | 1 |
| EX21-B06 | GROUND JUMPER | | 1 |
| EX21-B07 | POWER CORD | CSA | 1 |
| EX21-B08 | SPONG BLOCK | | 1 |
| EX21-B09 | POLYFOAM | | 1 |
| EX21-B10 | SCREW | 1/4-20UNC X 1/2 | 1 |
| EX21-B11 | LOCK WASHER | 1/4 | 3 |
| EX21-B12 | WASHER | 1/4 | 9 |
| EX21-B13 | BLADE TILT WASHER | | 2 |
| EX21-B14 | BLADE TILT DRIVE GEAR | | 2 |
| EX21-B15 | SCREW | 1/4-20UNC X 3/4 | 10 |
| EX21-B16 | ANGLE FOLLOWER | | 2 |
| EX21-B17 | SCREW | #10-32 X 5/16 | 8 |
| EX21-B18 | WASHER | #10 X 12 X 1 | 8 |
| EX21-B19 | NUT | 1/4-20UNC | 12 |
| EX21-B20 | ANGLE INDICATOR | | 1 |
| EX21-B21 | ALLEN SCREW | 1/4-20 X 1" | 2 |
| EX21-B22 | E RING | ETW-3 | 1 |
| EX21-B23 | TILT DETENT BARREL | | 1 |
| EX21-B24 | SPRING | | 1 |
| EX21-B25 | DETENT PLUNGER | | 1 |
| EX21-B26 | TILT HANDLE | | 1 |
| EX21-B27 | WASHER | 1/4 X 16 X 3 | 1 |
| EX21-B28 | BLADE TILT LOCKING LEVER | | 1 |
| EX21-B29 | FLAT HEAD SCREW | 1/4-20 X 3/4 | 4 |
| EX21-B36 | TILT LOCK DRAW ROD | | 1 |
| EX21-B38 | POINTER | | 1 |
| EX21-B39 | ROUND HEAD SCREW | M4 X 6MM | 1 |
| EX21-B40 | WASHER | M4 | 1 |
| EX21-B46 | COVER | | 1 |
| EX21-B47 | DUST CHUT | | 1 |
| EX21-B48 | ROUND HEAD SCREW | #8-32unc-5/16 | 4 |
| EX21-B49 | WASHER | #8-32unc | 4 |

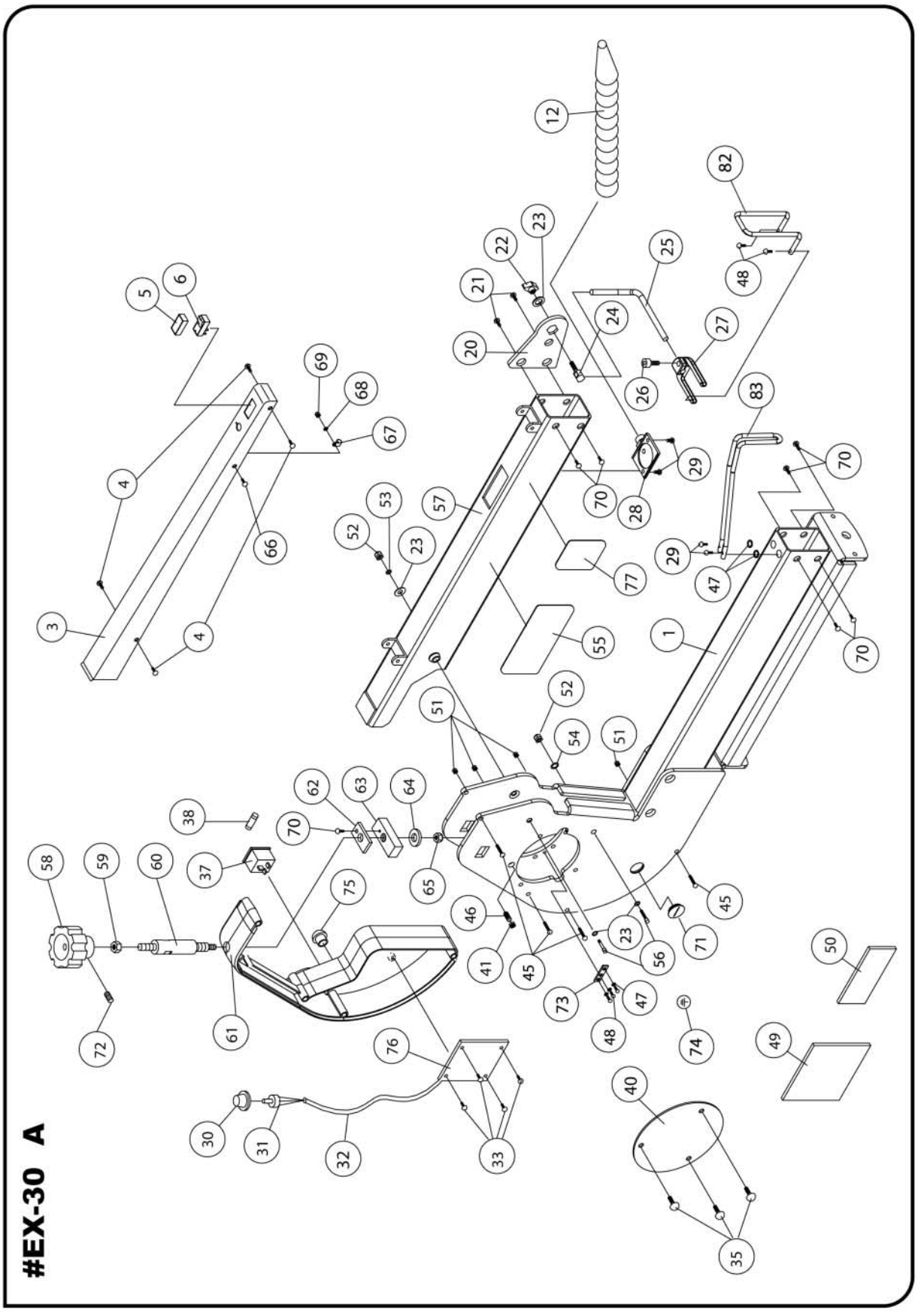
# EX-21 Parts Breakdown (C)



## PARTS LIST - EX-21CE (C)

| PART NO. | DESCRIPTION | SPECIFICATION | QTY |
|---|---|---|---|
| EX21CE-C02 | BALANCE BLOCK | | 1 |
| EX21CE-C03 | SET SCREW | M6 X 6 | 1 |
| EX21CE-C04 | ALLEN SCREW | 1/4-20 X 1/ 2 | 3 |
| EX21CE-C05 | LOCK WASHER | 1/ 4. | 3 |
| EX21CE-C06 | FLAT WASHER | 1/4 X 16 X 1.8 | 3 |
| EX21CE-C07 | MOTOR COVER PLATE | | 1 |
| EX21CE-C08 | SCREW | M6 X 16 | 4 |
| EX21CE-C09 | BEARING | 608ZZ | 1 |
| EX21CE-C10 | MOTOR CAM | | 1 |
| EX21CE-C11 | NUT | M8 X P1.25 LH | 1 |
| EX21CE-C12 | BEARING | 810 | 3 |
| EX21CE-C14N | ROCKER CAM | | 1 |
| EX21CE-C15 | LOCK NUT | M5 | 1 |
| EX21CE-C17 | BEARING | 0609 | 12 |
| EX21CE-C18 | BEARING INNER SLEEVE (SHORT) | | 6 |
| EX21CE-C19 | CAP SCREW | M5 X 28 | 1 |
| EX21CE-C20N | BEARING COVER | | 2 |
| EX21CE-C21 | BEARING | 1412 | 2 |
| EX21CE-C22 | MAIN ROCKER PIVOT | | 1 |
| EX21CE-C23 | NUT | M4 | 14 |
| EX21CE-C24 | CAP SCREW | M4 X 25 | 6 |
| EX21CE-C26 | AIR PUMP BELLOWS | | 1 |
| EX21CE-C27 | FRONT ROCKER | | 2 |
| EX21CE-C28 | WASHER | M8 X 15 X 0.6 | 4 |
| EX21CE-C29N | INNER BEARINGR SLEEVE - FRONT ROCKER | Ø8.03 X 18.40MM | 2 |
| EX21CE-C30 | BEARING INNER SLEEVE (LONG) | | 2 |
| EX21CE-C31 | ROCKER MOUNT | | 2 |
| EX21CE-C32 | CAP SCREW | M4 X 40 | 2 |
| EX21CE-C33 | CAP SCREW | M4 X 22 | 6 |
| EX21CE-C35 | STRUT | | 4 |
| EX21CE-C36 | BLADE CHUCK | | 1 |
| EX21CE-C37 | SET SCREW | M6X8 | 2 |
| EX21CE-C38 | BLADE CLAMP THUMB SCREW | | 2 |
| EX21CE-C39 | BLADE | | 1 |
| EX21CE-C40 | ALLEN KEY | 3MM | 1 |
| EX21CE-C41 | CLAMP BRACKET | | 1 |
| EX21CE-C42 | SET SCREW | 1/ 4-20UNC | 1 |
| EX21CE-C43 | SPRING | | 1 |
| EX21CE-C44 | TENSION LEVER | 5MM | 1 |
| EX21CE-C45N | SCREW POST | 5 X 18 | 1 |
| EX21CE-C46 | SLIDING BRACKET | | 1 |
| EX21CE-C48 | CAP SCREW | M6 | 1 |
| EX21CE-C49 | LOCK NUT | M6 | 1 |
| EX21CE-C50 | NUT | M6 | 1 |
| EX21CE-C52B | LINK NUT | | 1 |
| EX21CE-C54N | DRIVE LINK ASS'Y (SHORT) | | 1 |
| EX21CE-C57 | WASHER | M4 | 4 |
| EX21CE-C58 | INNER BEARING SLEEVE (LONG) | Ø6.02 X 16.50MM | 2 |
| EX21CE-C59 | BEARING INNER SLEEVE | M6 | 1 |
| EX21CE-C60 | WASHER | M5 | 2 |
| EX21CE-C61 | CAP SCREW | M4 X 27 | 2 |
| EX21CE-C62 | WASHER | M4 | 4 |
| EX21CE-C63A | DRIVE LINK ASS'Y (MEDIUM) | | 1 |
| EX21CE-C64 | DRIVE LIN K ASS'Y (LONG) | | 1 |
| EX21CE-C65 | MOTOR | | 1 |
| EX21CE-C66 | SPACER | | 1 |

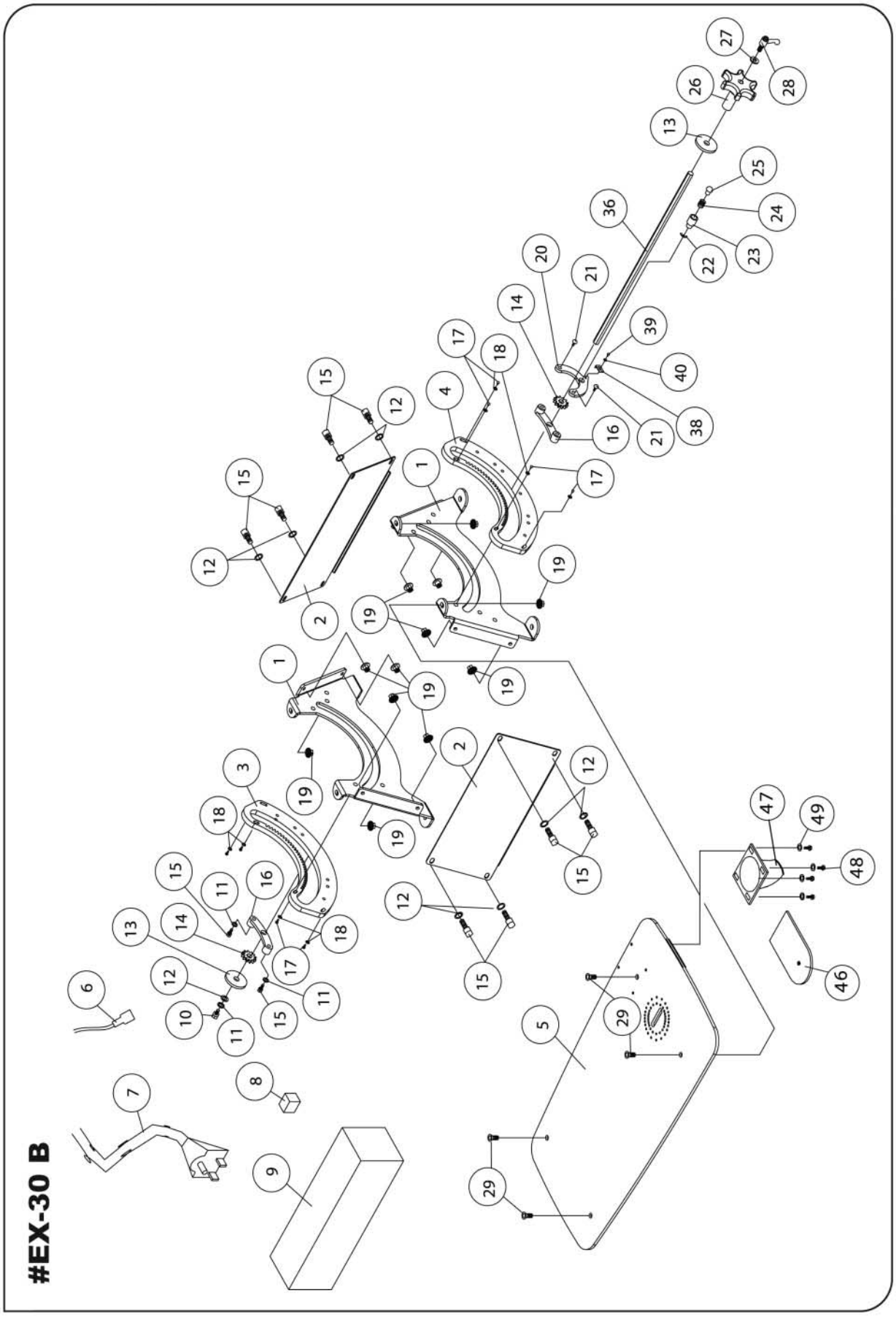
# EX-30 Parts Breakdown (A)



## PARTS LIST - EX-30CE (A)

| PART NO. | DESCRIPTION | SPECIFICATION | QTY |
|---|---|---|---|
| EX30-A01 | MAIN BODY | | 1 |
| EX30-A03 | TOP COVER | | 1 |
| EX30-A04 | ALLEN SCREW | #10-32 X 1/4" | 4 |
| EX30-A05 | SWITCH COVER | | 1 |
| EX30-A06 | SWITCH | | 1 |
| EX30-A12 | AIR NOZZLE | | 1 |
| EX30-A20 | HOLD DOWN MOUNT PLATE | | 1 |
| EX30-A21 | ALLEN SCREW | #10-32 X 3/8" | 2 |
| EX30-A22 | HOLD DOWN CLAMP KNOB | | 1 |
| EX30-A23 | WASHER | 1/4 X 16 X 1.8" | 4 |
| EX30-A24 | HOLD DOWN CLAMP SCREW | | 1 |
| EX30-A25 | HOLD DOWN BAR | | 1 |
| EX30-A26 | CAP SCREW | #10-32 X 1/2" | 1 |
| EX30-A27 | HOLD DOWN FORKS | | 1 |
| EX30-A28 | DUST BLOWER | | 1 |
| EX30-A29 | TAP SCREW | #8-32UNF 3/8" | 4 |
| EX30-A30 | VR KNOB | | 1 |
| EX30-A31 | VR | | 1 |
| EX30-A32 | CONTROL CABLE | | 1 |
| EX30-A33 | SCREW | M4 X 8 | 4 |
| EX30-A35 | ALLEN SCREW | 1/4-20 X 1/2 " | 3 |
| EX30-A37 | LINE CORD SOCKET | | 1 |
| EX30-A38 | FUSE | | 1 |
| EX30-A40 | GEAR COVER | | 1 |
| EX30-A41 | NUT | 3/8 X T5.5 | 1 |
| EX30-A45 | ALLEN SCREW | #10-32 X 2-1/4" | 4 |
| EX30-A46 | SCREW | 3/8" X 5/8" | 1 |
| EX30-A47 | WASHER | #8 | 5 |
| EX30-A48 | SCREW | #8-32 X 1/4" | 5 |
| EX30-A49 | MOTOR LABEL | | 1 |
| EX30-A50 | WARNING LABEL | | 1 |
| EX30-A51 | NYLON NUT | #10-32 | 4 |
| EX30-A52 | NYLON NUT | 1/4-20UNC | 2 |
| EX30-A53 | LOCK WASHER | 1/4" | 1 |
| EX30-A54 | FLAT WASHER | 1/4" (O.D.13) | 1 |
| EX30-A55 | LABEL | | 2 |
| EX30-A56 | SCREW | 1/4 X 2-1/2" | 2 |
| EX30-A57 | UPPER ARM | | 1 |
| EX30-A58 | KNOB | | 1 |
| EX30-A59 | NUT | M6 | 1 |
| EX30-A60 | ADJUSTING LEVER | | 1 |
| EX30-A61 | CONTROL BOX | | 1 |
| EX30-A62 | CROSS BLOCK RETAINER | | 1 |
| EX30-A63 | HOUSING CROSS BLOCK | | 1 |
| EX30-A64 | FLAT WASHER | M6 X 16 X 2 | 1 |
| EX30-A65 | NYLON NUT | M6 | 1 |
| EX30-A66 | ALLEN SCREW | | 1 |
| EX30-A67 | R FASTENER | | 1 |
| EX30-A68 | WASHER | | 1 |
| EX30-A69 | NYLON NUT | | 1 |
| EX30-A70 | ALLEN SCREW | | 7 |
| EX30-A71 | BUTTON | | 1 |
| EX30-A72 | SET SCREW | | 1 |
| EX30-A73 | GROUND PLATE | | 1 |
| EX30-A74 | GROUND LABEL | | 1 |
| EX30-A75 | STRAIN RELIEF | | 1 |
| EX30-A76 | MOTOR CONTROL SET | | 1 |
| EX30-A77 | LABEL | | 1 |
| EX30-A82 | UPPER BLADE GUARD | | 1 |
| EX30-A83 | LOWER BLADE GUARD | | 1 |

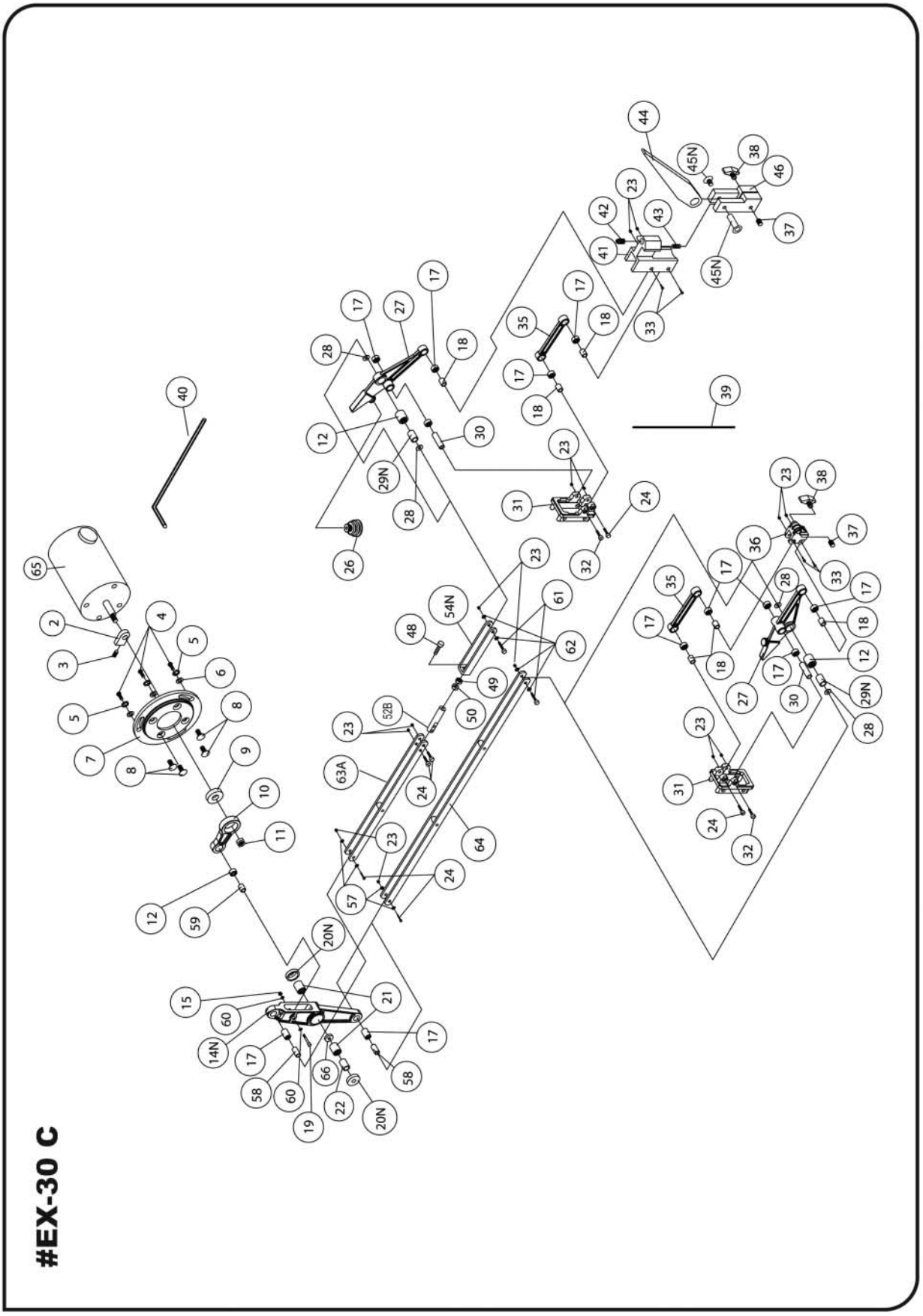
# EX-30 Parts Breakdown (B)



## PARTS LIST - EX-30CE (B)

| PART NO. | DESCRIPTION | SPECIFICATION | QTY |
|---|---|---|---|
| EX30-B01 | TRUNNION | | 2 |
| EX30-B02 | SIDE PANEL | | 2 |
| EX30-B03 | REAR TRUNNION PLATE | | 1 |
| EX30-B04 | FRONT TRUNNION PLATE | | 1 |
| EX30-B05 | TABLE | | 1 |
| EX30-B06 | GROUND JUMPER | | 1 |
| EX30-B07 | POWER CORD | CSA | 1 |
| EX30-B08 | SPONG BLOCK | | 1 |
| EX30-B09 | POLYFOAM | | 1 |
| EX30-B10 | SCREW | 1/4-20UNC X 1/2 | 1 |
| EX30-B11 | LOCK WASHER | 1/4 | 3 |
| EX30-B12 | WASHER | 1/4 | 9 |
| EX30-B13 | BLADE TILT WASHER | | 2 |
| EX30-B14 | BLADE TILT DRIVE GEAR | | 2 |
| EX30-B15 | SCREW | 1/4-20UNC X 3/4 | 10 |
| EX30-B16 | ANGLE FOLLOWER | | 2 |
| EX30-B17 | SCREW | #10-32 X 5/16 | 8 |
| EX30-B18 | WASHER | #10 X 12 X 1 | 8 |
| EX30-B19 | NUT | 1/4-20UNC | 12 |
| EX30-B20 | ANGLE INDICATOR | | 1 |
| EX30-B21 | ALLEN SCREW | 1/4-20 X 1" | 2 |
| EX30-B22 | E RING | ETW-3 | 1 |
| EX30-B23 | TILT DETENT BARREL | | 1 |
| EX30-B24 | SPRING | | 1 |
| EX30-B25 | DETENT PLUNGER | | 1 |
| EX30-B26 | TILT HANDLE | | 1 |
| EX30-B27 | WASHER | 1/4 X 16 X 3 | 1 |
| EX30-B28 | BLADE TILT LOCKING LEVER | | 1 |
| EX30-B29 | FLAT HEAD SCREW | 1/4-20 X 3/4 | 4 |
| EX30-B36 | TILT LOCK DRAW ROD | | 1 |
| EX30-B38 | POINTER | | 1 |
| EX30-B39 | ROUND HEAD SCREW | M4 X 6MM | 1 |
| EX30-B40 | WASHER | M4 | 1 |
| EX30-B46 | COVER | | 1 |
| EX30-B47 | DUST CHUT | | 1 |
| EX30-B48 | ROUND HEAD SCREW | #8-32unc-5/16 | 4 |
| EX30-B49 | WASHER | #8-32unc | 4 |

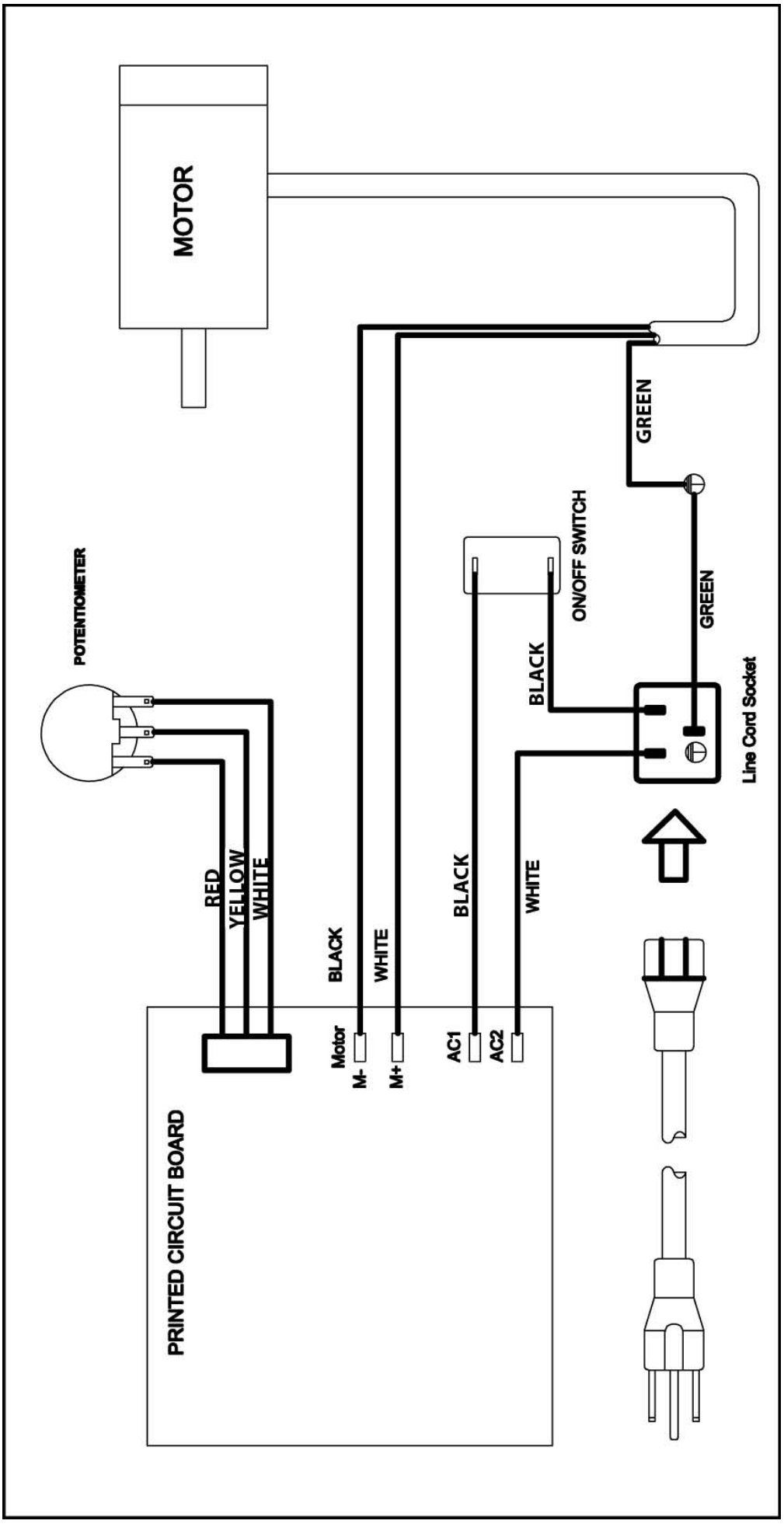
# EX-30 Parts Breakdown (C)



## PARTS LIST - EX-30CE (C)

| PART NO. | DESCRIPTION | SPECIFICATION | QTY |
|---|---|---|---|
| EX30-C02 | BALANCE BLOCK | | 1 |
| EX30-C03 | SET SCREW | M6 X 6 | 1 |
| EX30-C04 | ALLEN SCREW | 1/4-20 X 1/ 2 | 3 |
| EX30-C05 | LOCK WASHER | 1/ 4. | 3 |
| EX30-C06 | FLAT WASHER | 1/4 X 16 X 1.8 | 3 |
| EX30-C07 | MOTOR COVER PLATE | | 1 |
| EX30-C08 | SCREW | M6 X 16 | 4 |
| EX30-C09 | BEARING | 608ZZ | 1 |
| EX30-C10 | MOTOR CAM | | 1 |
| EX30-C11 | NUT | M8 X P1.25 LH | 1 |
| EX30-C12 | BEARING | 810 | 3 |
| EX30-C14N | ROCKER CAM | | 1 |
| EX30-C15 | LOCK NUT | M5 | 1 |
| EX30-C17 | BEARING | 0609 | 12 |
| EX30-C18 | BEARING INNER SLEEVE (SHORT) | | 6 |
| EX30-C19 | CAP SCREW | M5 X 28 | 1 |
| EX30-C20N | BEARING COVER | | 2 |
| EX30-C21 | BEARING | 1412 | 2 |
| EX30-C22 | MAIN ROCKER PIVOT | | 1 |
| EX30-C23 | NUT | M4 | 14 |
| EX30-C24 | CAP SCREW | M4 X 25 | 6 |
| EX30-C26 | AIR PUMP BELLOWS | | 1 |
| EX30-C27 | FRONT ROCKER | | 2 |
| EX30-C28 | WASHER | M8 X 15 X 0.6 | 4 |
| EX30-C29N | INNER BEARINGR SLEEVE - FRONT ROCKER | Ø8.03 X 18.40MM | 2 |
| EX30-C30 | BEARING INNER SLEEVE (LONG) | | 2 |
| EX30-C31 | ROCKER MOUNT | | 2 |
| EX30-C32 | CAP SCREW | M4 X 40 | 2 |
| EX30-C33 | CAP SCREW | M4 X 22 | 6 |
| EX30-C35 | STRUT | | 4 |
| EX30-C36 | BLADE CHUCK | | 1 |
| EX30-C37 | SET SCREW | M6X8 | 2 |
| EX30-C38 | BLADE CLAMP THUMB SCREW | | 2 |
| EX30-C39 | BLADE | | 1 |
| EX30-C40 | ALLEN KEY | 3MM | 1 |
| EX30-C41 | CLAMP BRACKET | | 1 |
| EX30-C42 | SET SCREW | 1/ 4-20UNC | 1 |
| EX30-C43 | SPRING | | 1 |
| EX30-C44 | TENSION LEVER | 7MM | 1 |
| EX30-C45N | SCREW POST | 5 X 18 | 1 |
| EX30-C46 | SLIDING BRACKET | | 1 |
| EX30-C48 | CAP SCREW | M6 | 1 |
| EX30-C49 | LOCK NUT | M6 | 1 |
| EX30-C50 | NUT | M6 | 1 |
| EX30-C52B | LINK NUT | | 1 |
| EX30-C54N | DRIVE LINK ASS'Y (SHORT) | | 1 |
| EX30-C57 | WASHER | M4 | 4 |
| EX30-C58 | INNER BEARING SLEEVE (LONG) | Ø6.02 X 16.50MM | 2 |
| EX30-C59 | BEARING INNER SLEEVE | M6 | 1 |
| EX30-C60 | WASHER | M5 | 2 |
| EX30-C61 | CAP SCREW | M4 X 27 | 2 |
| EX30-C62 | WASHER | M4 | 4 |
| EX30-C63A | DRIVE LINK ASS'Y (MEDIUM) | | 1 |
| EX30-C64 | DRIVE LIN K ASS'Y (LONG) | | 1 |
| EX30-C65 | MOTOR | | 1 |
| EX30-C66 | SPACER | | 1 |

# Wiring Diagram

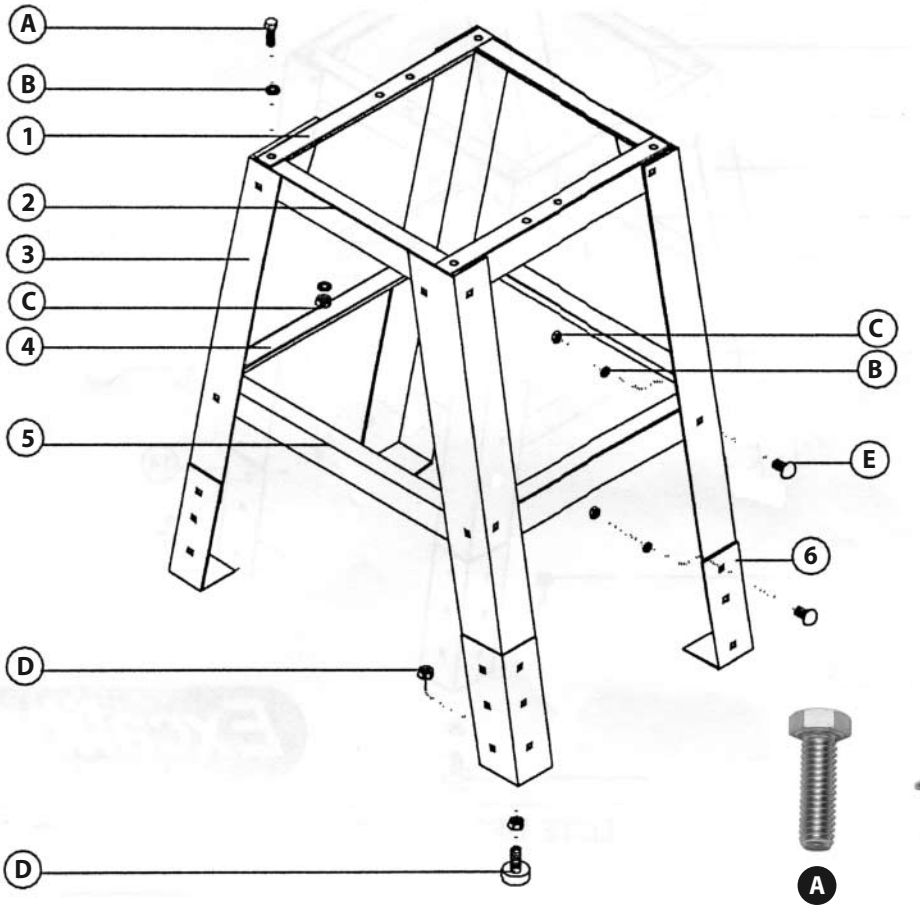


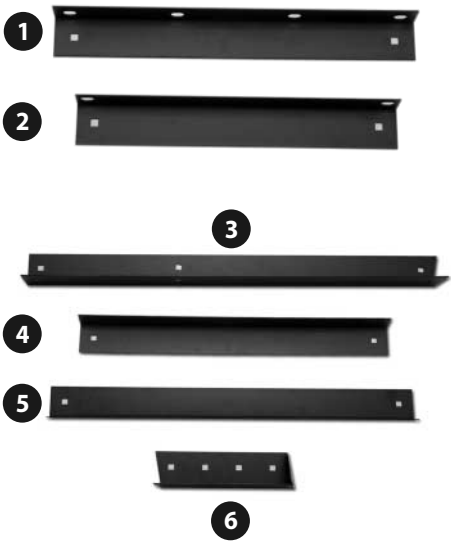
## Foot Switch with Trailing Plug & Socket

These two foot-operated safety switches are equipped with trailing plugs and sockets and can easily be inserted between the mains supply and any machine fitted with a no volt release switch, such as a drill, bandsaw or lathe.

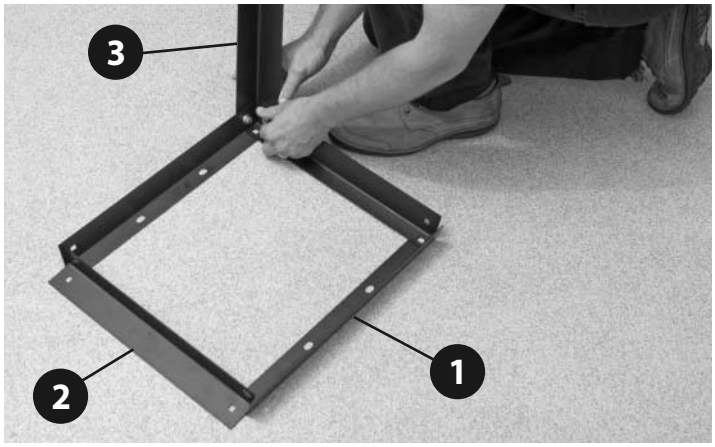
Operation of the switch interrupts the supply to the solenoid and the machine is stopped; re-starting can only be achieved by operating the NVR switch on the machine, creating an excellent safety measure in those situations where safety is of paramount.

# Stand Assembly

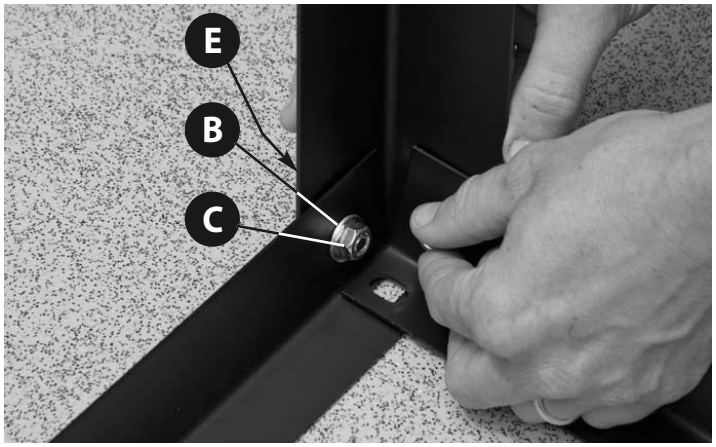


| A | E | B | C | D |
|---|---|---|---|---|
| x4 M8 Bolts | x24 M8 Coatch Bolts | x32 M8 Washers | x28 M8 Nuts | x4 Thread Rubber Foot |




Step **1**

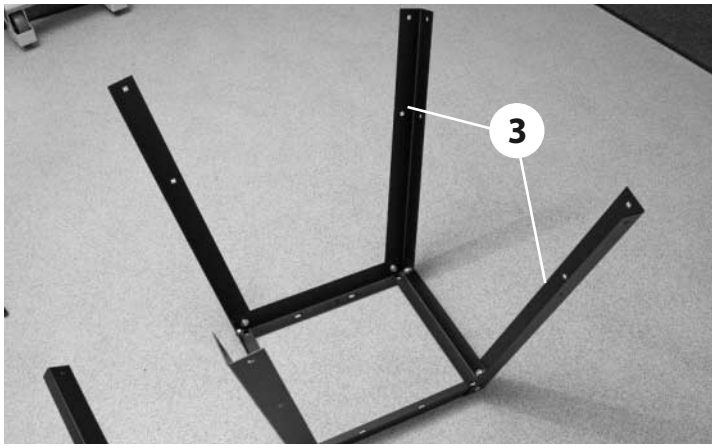



Step **2**

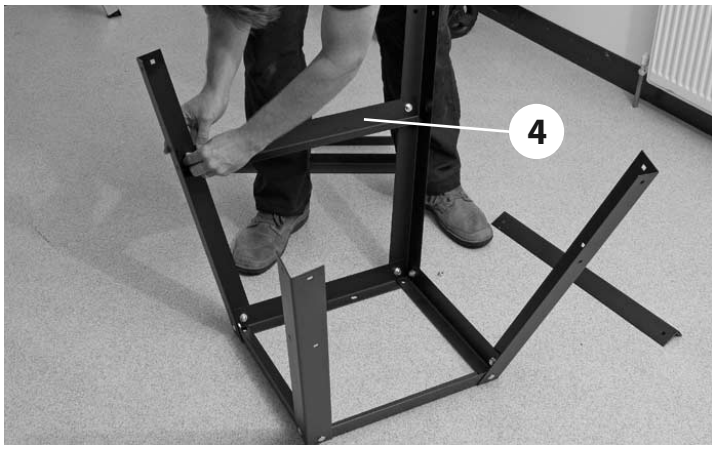


Continues Over

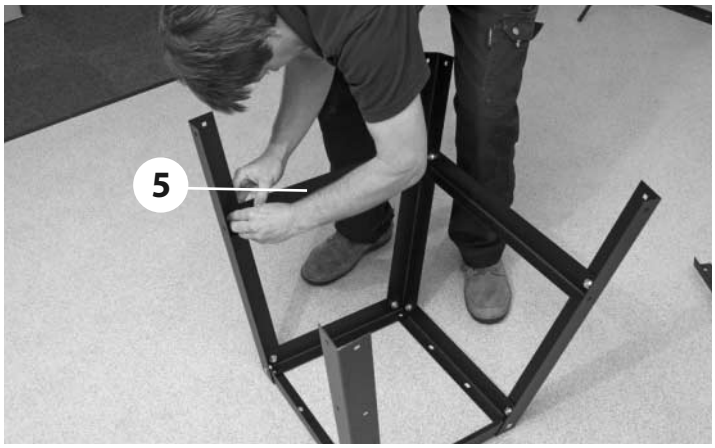
# Stand Assembly



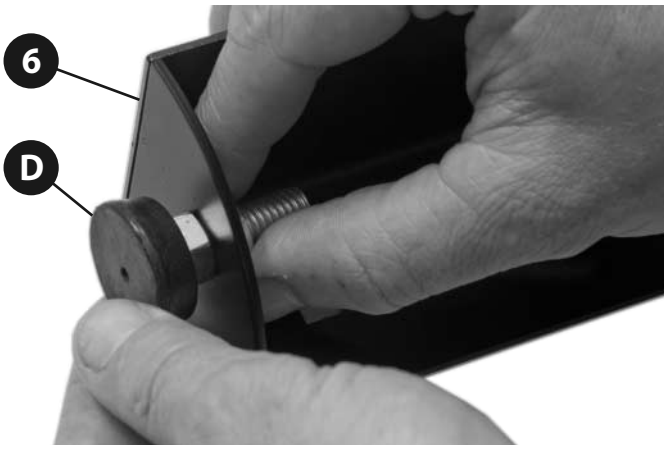

Step **3**



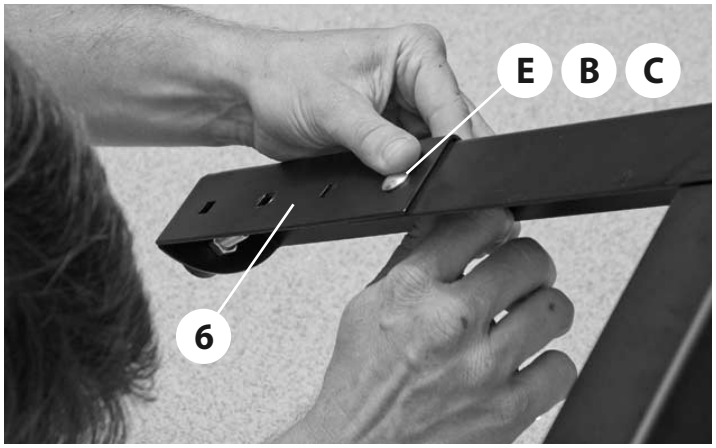

Step **4**




Step **5**



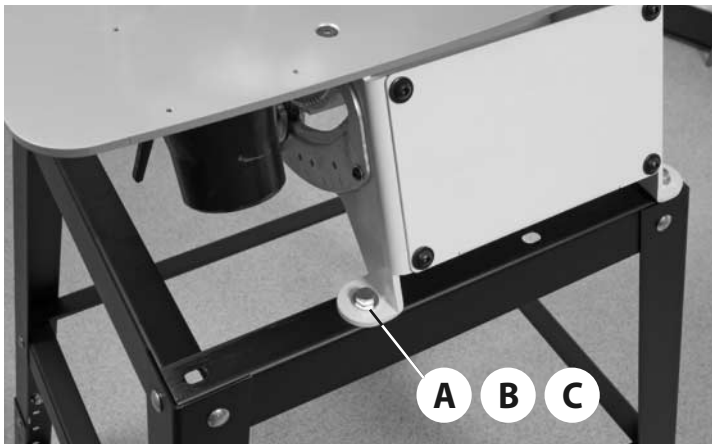

Step **6**




Step **7**

Use the holes in the bracket **(6)** to adjust the the stand height

Stand assembled




Lower the scroll saw on top of the stand and lineup the holes, secure using the four bolts **(A)** washers **(B)** and Nuts **(C)**